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THE RECENT WORK OF ALBRO & LINDEBERG

BY C. MATLACK PRICE

A CONTEMPORARY writer on architectural criticism has tersely scored a point on the critics in saying "We subsist on a number of architectural habits, on scraps of tradition, on caprices and prejudices . . . by means of which there is no building so bad that it cannot, with a little ingenuity be justified, or so good that it cannot plausibly be condemned."

In the face of this arraignment the critic feels by no means inclined to indulge in verbal trickery, if for no other reason than its sheer futility. It is to be hoped, indeed, that masks will some day be off in this business of criticism—that poor architecture will not be praised by some excuse that it is "colloquial," or "idiomatic," that some insane architectural experiment, in truth a fiasco, will not be applauded as an "expression of forceful originality."

In other words, there is a possibility that some value might be attached to the utterances of critics, if critics were known to be habitually honest.

In undertaking a discussion of the work of Harrie T. Lindeberg, however, there is no question of whether or not to be honest. The work is honest, and no fanciful catch-words should be regarded as necessary one way or the other to hoodwink the public or the profession—or the critic himself.

Certain broad truths concerning architecture in this country are apparent, and to any but professional readers the understanding of these would obviously aid in appreciating this architect's position.

His exact place in the domestic architecture of today, however, could not very permanently be stated, nor would it be entirely desirable if this were possible, since, with each year, he is occupying a more advanced position.

There are those who insist upon identifying a given architect with some specific "style," and, failing this, they fail to form any intelligent estimate of his work, either collectively or in separate instances. Such would fail to adequately understand Mr. Lindeberg's work—but because of its real uniformity and apparent diversity rather than because it is actually diverse. In considerations dealing with architecture, as with many other things, *form* is less important in the long run than *feeling,* though both should be duly reckoned, and madness lies only in confusing the two.

It might be difficult for one whose vision is limited to form to understand how one architect could either conscientiously or successfully design a house so picturesque and informal as the Stillman house at Pocantico Hills, or so classic and dignified as the Tracy Dows house at Rhinebeck. A few "intermediates," more formal than the first or less formal than the last might help in the question, but there would be even greater surprises in the works of Harrie T. Lindeberg in these last two years, of which 1914 has been spent dis-associated from his former partner, L. C. Albro. Since Mr. Lindeberg has always been the designer in the firm, the study of his work from the beginning of the firm of Albro & Lindeberg offers no complications.

It is an unfortunate fact that good architects are not always materially successful, and that successful architects are not always good. In the latter case, however, it is consoling to reflect that their success is short-lived. When a good architect is also successful, it must be regarded as worth while for layman and professional together to determine as far as may be possible, what causes this condition.

Broadly speaking, there are two considerations in architecture—practical, or utilitarian considerations, and esthetic or superficial considerations. If an architect were to make the grave mistake (as many do) of giving preëminence to either of these considerations in his work, he must obviously fail in his broader professional function, and even if he please certain individuals, there must always be a fifty per cent. of his public entertaining a very low opinion of his ability.

Thus there are apparent two architectural fallacies, since any *ideé fixé,* pursued without judgment, may be said to be a fallacy. These are the utilitarian fallacy and the picturesque, or esthetic fallacy—the first ignoring beauty and the second ignoring practicality. To adhere to one or the other would be as stupid as to adhere to one style, and the rightly successful architect is the practitioner who combines the two so skilfully that it is difficult to say whether his house is a work of art embracing all the essentially practical elements, or a fundamentally practical fabric embellished by the hand of an artist. It is this balance which is as difficult to achieve as it is obvious to demand, and putting any considerations of style, technique or expression temporarily in the discard, it is the failure to attain this balance

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which presents by far the greater part of our architecture, especially of our domestic architecture, from "arriving."

Nor, lacking this balance, is it intelligent to discuss such matters as detail or architectural technique, for the same reason that a painter is not to be praised for his handling of the draperies on a figure if the figure underneath is not rightly proportioned.

At the outset of reaching some conclusion upon the work of Harrie T. Lindeberg, then, there is to be found, as we had always suspected, an unusual degree of architectural sanity in his broader conceptions, and this was manifested in his earliest works after he had "graduated" from the ennobling firm of McKim, Mead and White. He was accused of a few "tricks," especially in his ingenious and pleasing handling of roofs, but there has always appeared to be in such accusations a good deal more praise than discredit. A great many artists who ought to be less childish have deprecated the art of Maxfield Parish, but they have not been honest enough to say that it was because he thought of his "tricks" before they did.

Mr. Lindeberg, at all events, should have been rather pleased, at the very beginning of his career, that his houses attracted this much attention, because there are so many architects who are not even interesting enough to draw the critic's fire. There are very few people, I think, who had not rather be attacked than ignored—and a few bravely eccentric spirits find greater pleasure in being attacked than praised.

One would not say that "in spite of such criticisms, his work went sturdily and progressively forward;" it went sturdily and progressively—even amazingly—forward on its own peculiar merits entirely regardless of critical question or praise. It is a significant fact that Mr. Lindeberg's houses very soon became recognizable, even to the lay observer, as his work, and this is because there may be said to exist, in all of them, a dominant note which can only be called "personality." There were not any obvious tricks or mannerisms—not even to the extent that such may be traced in the works of Charles A. Platt or of Wilson Eyre.

This identity, however, became, or always was, expressed more in detail than in broader considerations, for the fleeting prospect of a house from a passing motor car tells us nothing of its floor-plan or how conveniently the closets are arranged, and leaves us only with the impression of its general character—and this character has always been "Lindeberg."

Pursuing the analysis of his work in a consecutive manner, there are to be determined, as briefly as possible, characteristics of plan, of general proportions, of detail, of interior, of "style" (if any) and of general manner, or collective impression.

The practical adaptibility of his country house plans is already too well known to require any very elaborate or eulogistic exposition here—suffice to say that they are designed to meet the requirements of American country life of today, that they are sane, careful, logical arrangements of the rooms in the country homes of American gentlemen.

In the matter of general proportions his houses have been particularly happy, and although the different kinds of houses which he has designed have called for varying treatments, the whole has invariably presented an aspect at once pleasing and interesting. It has, in other words, fitted pleasantly into its surroundings without being flatly inconspicuous, and has been interestingly unusual or striking without being bizarre or eccentric.

In detail there has always been a good deal of the restraint which is associated with Platt, combined with a certain confidently adventuresome quality which is dangerous in the hands of a less able designer. It would be difficult to say whether some of Mr. Lindeberg's detail has been clever experiment, justified by its success, or certain procedure of which the result was pre-visualized by the architect. It is not that he is to be supposed to take liberties with decent architectural forms (which is a deplorable and usually futile mistake) but rather that he serves them up so freshly and confidently. His very confidence assures the success of such departures as he has made, because nothing which is not based on a very definite precedent can succeed unless it has been conceived and executed by a hand which carries the courage of its convictions. A certain blythe quality of architectural fearlessness, never to be confused with architectural foolishness, is one of the salient qualities which has contributed toward imprinting a very definite character upon Mr. Lindeberg's work.

In the design of interiors there are evident many of the qualities which stamp the exteriors, with an added opportunity to express qualities of *finesse,* both technical and atmospheric. Technically there is a remarkable nicety and refinement of mouldings, large wall spaces are pleasantly treated, the windows are happily disposed and all proportions are well studied. Atmospherically there is a certain note of quiet distinction in general and a marked feeling of appropriateness in each room in particular. To achieve these things is to succeed in the design of interiors, and above all this architect's treatment of interiors is pleasantly complementary with the exterior of his houses.

In touching upon the question of "style," there comes up one of the most important generalities to be appreciated in Mr Lindeberg's work—and this is the fact that he has never allowed himself (even if he had been inclined) to enslave himself to any specific architectural "style" or "period" He has borrowed with remarkable skill and admirable frankness from the great storehouse of precedent, but for the most part he has borrowed inspiration rather than actual form. The critic must find a difficult task if he be endeavoring to trace any palpable "derivations" in his work, for blended with whatever elements there may be of a derivative nature, there is always an all-pervasive quality of fresh architectural imagination and originality and sanity.

Firm in his belief that the most essential quality to be expressed in the country house is one of *domesticity,* Mr. Lindeberg has evolved and built up his own peculiarly pleasant and engaging architectural style on a foundation as logical as it happens to be unusual. Placing this idea first, and rendering it in well-studied architectural terms, he has succeeded in a manner which is forceful without being insistent or over-emphatic of any personal bias or preference in style. It is better to be heard in a crowd, because the crowd respectfully falls silent to listen to a well-modulated voice, than to fight for a hearing by shouting more loudly than anyone else.

In declaring this architect's independence of style it is not to be implied for a moment that he disregards style or that he does not understand it, but rather that he understands it so well that he is capable of deviating from it—he knows its limitations in expression, but is not an insurgent or a "secessionist."

In Mr. Lindeberg's houses there may be found much that is English, much that is Italian and a little that is French—but there is always a great deal more, the whole *character* of the house, that is peculiarly and convincingly personal. This *architectural personality* is not only its most pronounced feature, but the architect's greatest reward for such temerity as he may have shown at times in depriving himself of forming a protective alliance with Italian villas or English country-houses.

Having instantaneously made a reputation at the beginning of the career of the firm of Albro & Lindeberg with the unaffectedly picturesque Stillman house, Mr. Lindeberg was courageous enough, and intelligent enough not to do what a good many architects and painters would have done and frequently have done. He did not force all his subsequent work into grooves of similar expression. He has, indeed, reverted to the same kind of a design in several delightful instances, but neither because the treatment was successful in the Stillman house nor because he lacked further invention or ambition. There was the dignified informally-formal Tracy Dows house, and later a trio of very remarkable country houses, which were published in this magazine in the fall of 1912.

Of these the Kerr house was generally reckoned an expression of Mr. Lindeberg's ideal of a country house, though the more picturesque Babcock house and the charming Rossiter house were the best of the year in this country.

No comprehensive publication of his work has since occurred, and it is of unusual interest to study the group of buildings which has occupied him for the past two years, and to note the extraordinary development in architectural imagination which they exemplify.

In the Paul Moore house, at Convent, N. J., there is a great deal that is more than interesting. It astonishes. It would be difficult to find a more picturesque or pleasing roof-line, or a house which naturally falls into so many delightful "compositions" of gables and chimneys and windows. The roof is of heavy graduated slate, and the house itself is of brick, painted white, which latter is a device as unusual to see as it is peculiarly pleasing in this house. There are a good many houses which, similarly devised, would appear even worse than they are. It is to be hoped that no architect whose sense of invention is impaired, will, seeing this house, decide that a coat of white paint will save an otherwise hopeless brick house from being uninteresting. "What do you mix your paints with?" the student asked the great master. "Brains" was the answer, and the story is as good today as it was in the remote past in which it was first told.

The entrance of the Paul Moore house, both inside and out, is very unusually and delightfully achieved, and evidences Mr. Lindeberg's liking for lots of good, clear glass in his houses.

The Gillespie House, at Morristown, N. J., is a house which seems already to be of an ancestral sort—it seems so peculiarly "established" that one doubts it has not always stood on its site. One must become impressed, however, with the conviction that no other architect could have designed the entrance gable, or, having designed it, could have executed it in a way so strangely successful.

The Boardman Robinson house at Forest Hills, and the Cooper house at Riverdale, both near New York, are like each other in their expression of a very pleasant kind of moderate sized house, with domesticity so much a keynote that one suspects them of being very livable homes—a suspicion not likely to fall upon most American country houses.

A very happy flavor of domesticity is an important element in the charm of the "Holiday Farm" Astor Memorial at Rhinebeck, N. Y. By the disposition of windows, as well as by the general "country house" character of the design, a fairly large building has been intentionally and very ingeniously made to look quite small, and even intimate. The detailing of the entrance will come to be reckoned as one of Mr. Lindeberg's very finest achievements. He uses carved ornament very seldom, and if this be his manner of doing it, the circumstance is to be regretted.

There are two "stately homes" among these recent houses, and they impart a good deal of the impression of the Tracy Dows manor—a sense that it would be difficult to say whether they are dignified places in which to live, or more essentially places in which to live, expressed in terms of architectural dignity. It is a very easy matter to design houses of this kind and size so that they are austere and uncompromising.

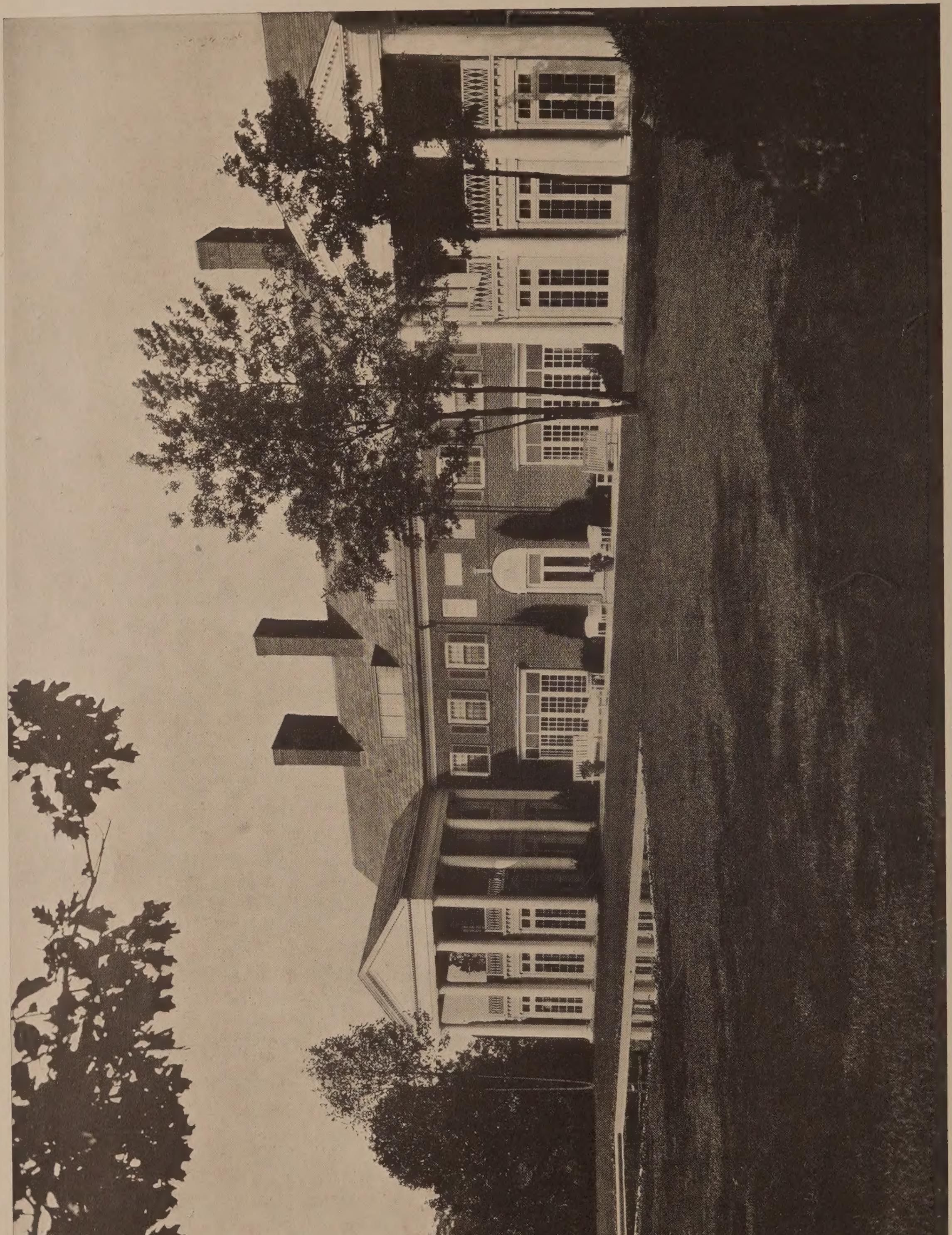
Of the two the Batterman house at Mill Neck, L. I., may be more interesting than the Sprague house at Lake Forest, Ill. It is very classic, very "southern" and reposeful, but even its distinct classicism has not deterred the architect from letting us have a Palladian arrangement in the far right wing of the garden front. He is not a slave to any style, but one must imagine that he has a weakness for Palladian compositions—and since he introduces them so pleasantly and often so unexpectedly—as in the entrance of the Gillespie house—it is a distinctly fortunate *penchant.*

There is a good deal of very pleasant gardening about the Batterman house, with Mr. Lindeberg's unaffected handling of brick in steps and terraces, with the garden pottery and the plain rectangular pool which made the terrace on the garden front of the Kerr house so delightful.

The detail of the door of the Batterman house (see Architecture Series of Measured Details, No. 31 in this issue) should stand as evidence that Mr. Lindeberg can be as exact and scholarly as he can be free and imaginative. When he is frankly designing in the vein of the picturesque, he is frankly picturesque, and when he is designing in a style, he makes a serious matter of it. The most captious stylist could not accuse him of any architectural nonsense. This door is as beautiful a study in the refinement and exquisite charm of the pure Georgian Colonial as the door of the Tracy Dows house.

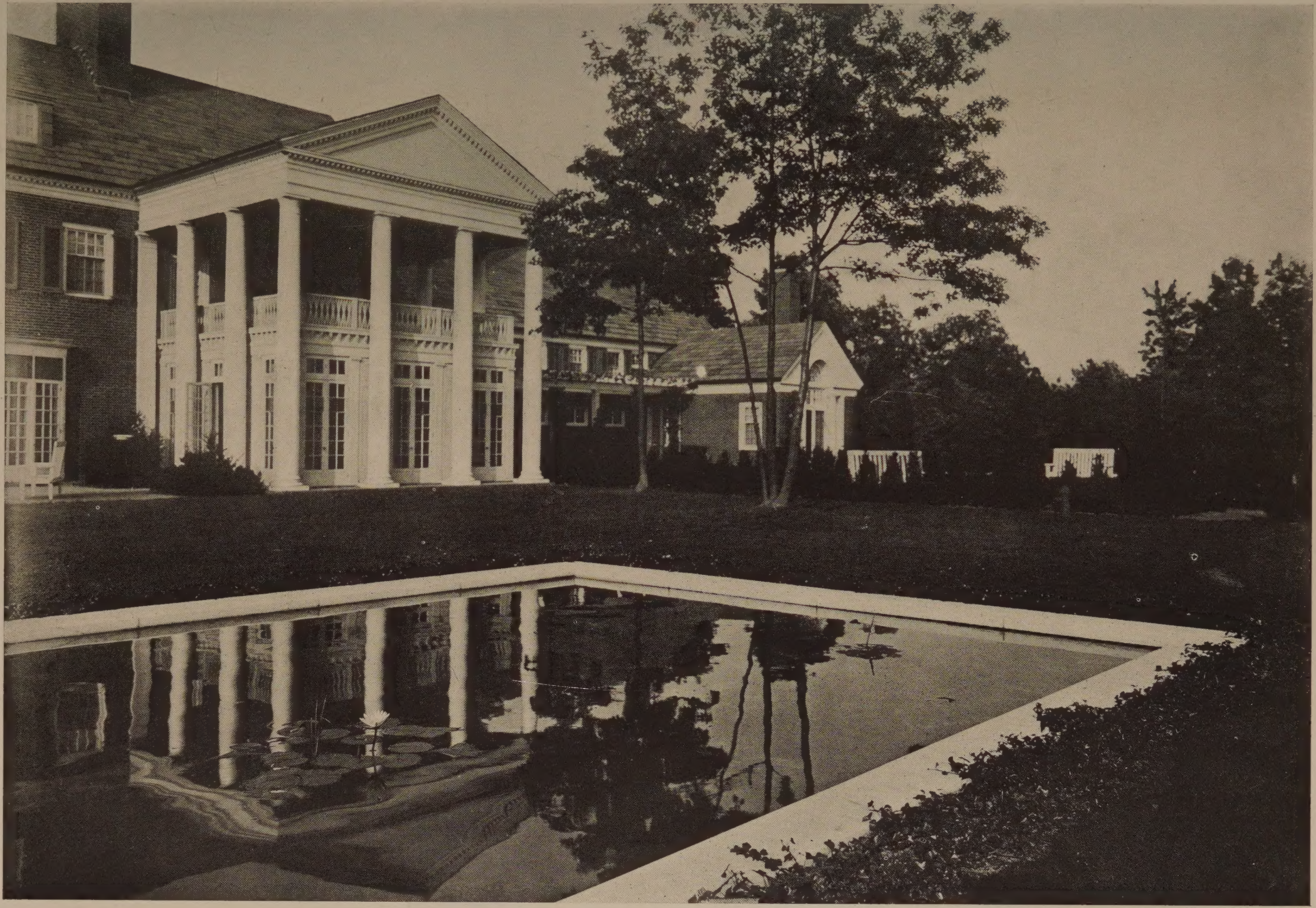
Some architects adopt the picturesque in their work because they are too careless to be accurate. With Mr. Lindeberg it is evidently a matter of selection.

In the course of the years in which he has been practising he has undoubtedly developed a distinct standard, or even a style of architecture—a style which has been developed through a keen appreciation of the value of precedent as a means rather than an end in architectural expression, and which is dependent rather upon its adherence to a high order of architectural integrity than upon any "tricks." His work bears a certain stamp of well-bred reserve in its conception, and indicates even to the untrained eye, an unusually high degree of architectural surety in its execution.



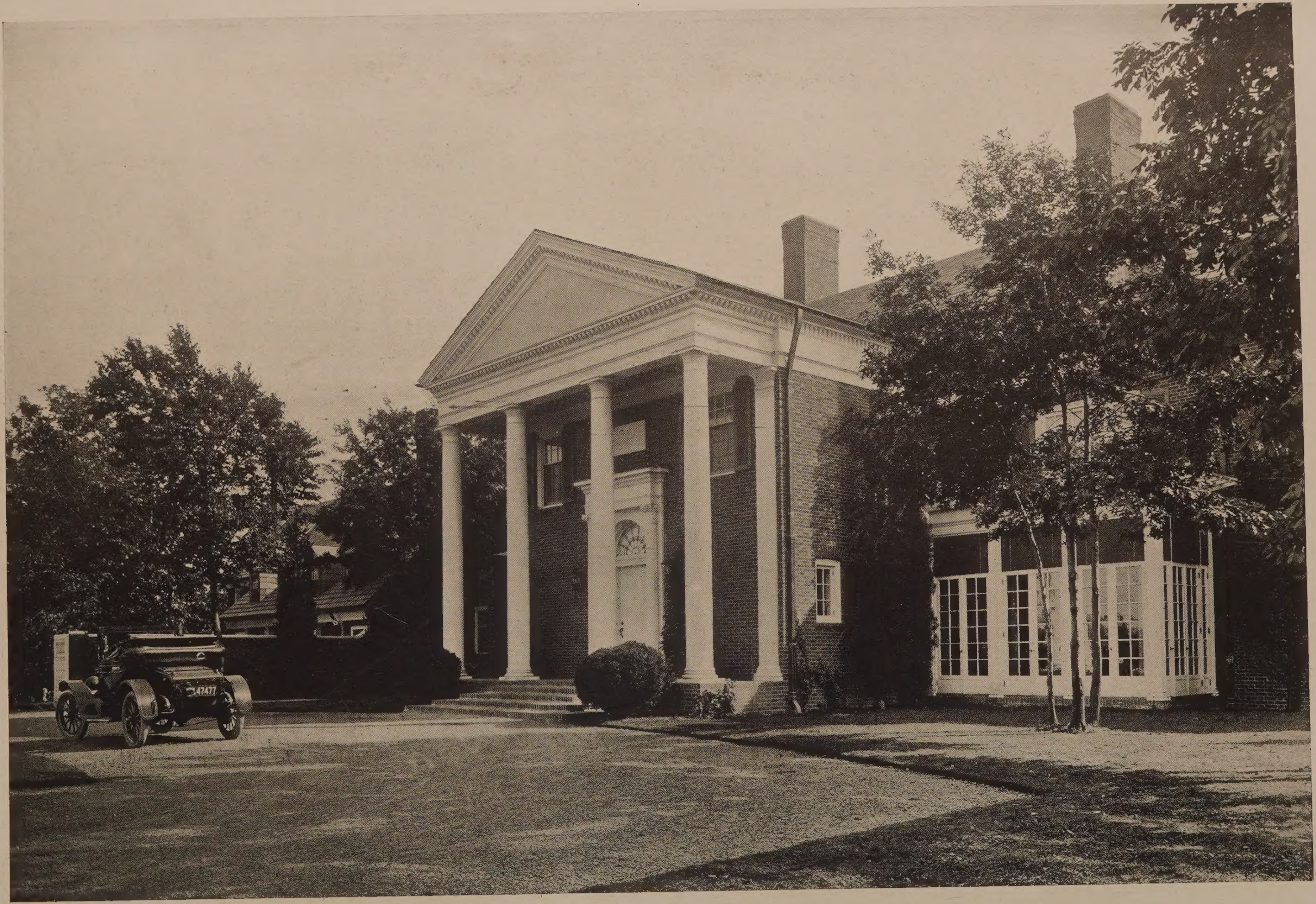
HOUSE, H. L. BATTERMAN, MILL NECK, L. I.

Designed by H. T. Lindeberg, Albro & Lindeberg, Architects.



DETAIL, SOUTH FRONT, HOUSE, H. L. BATTERMAN, MILL NECK, L. I.

Designed by H. T. Lindeberg, Albro & Lindeberg, Architects.



ENTRANCE FRONT, HOUSE, H. L. BATTERMAN, MILL NECK, L. I.

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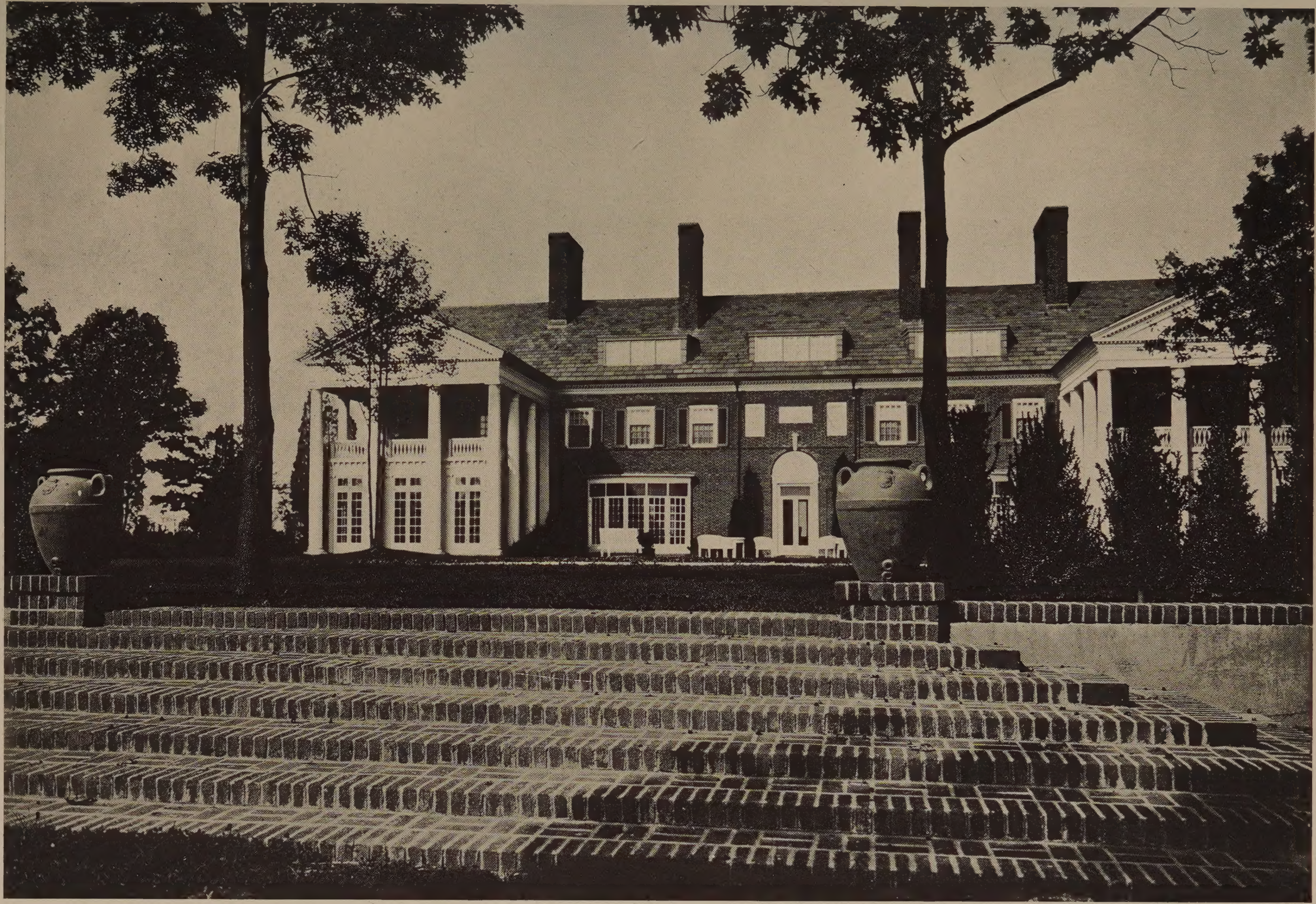
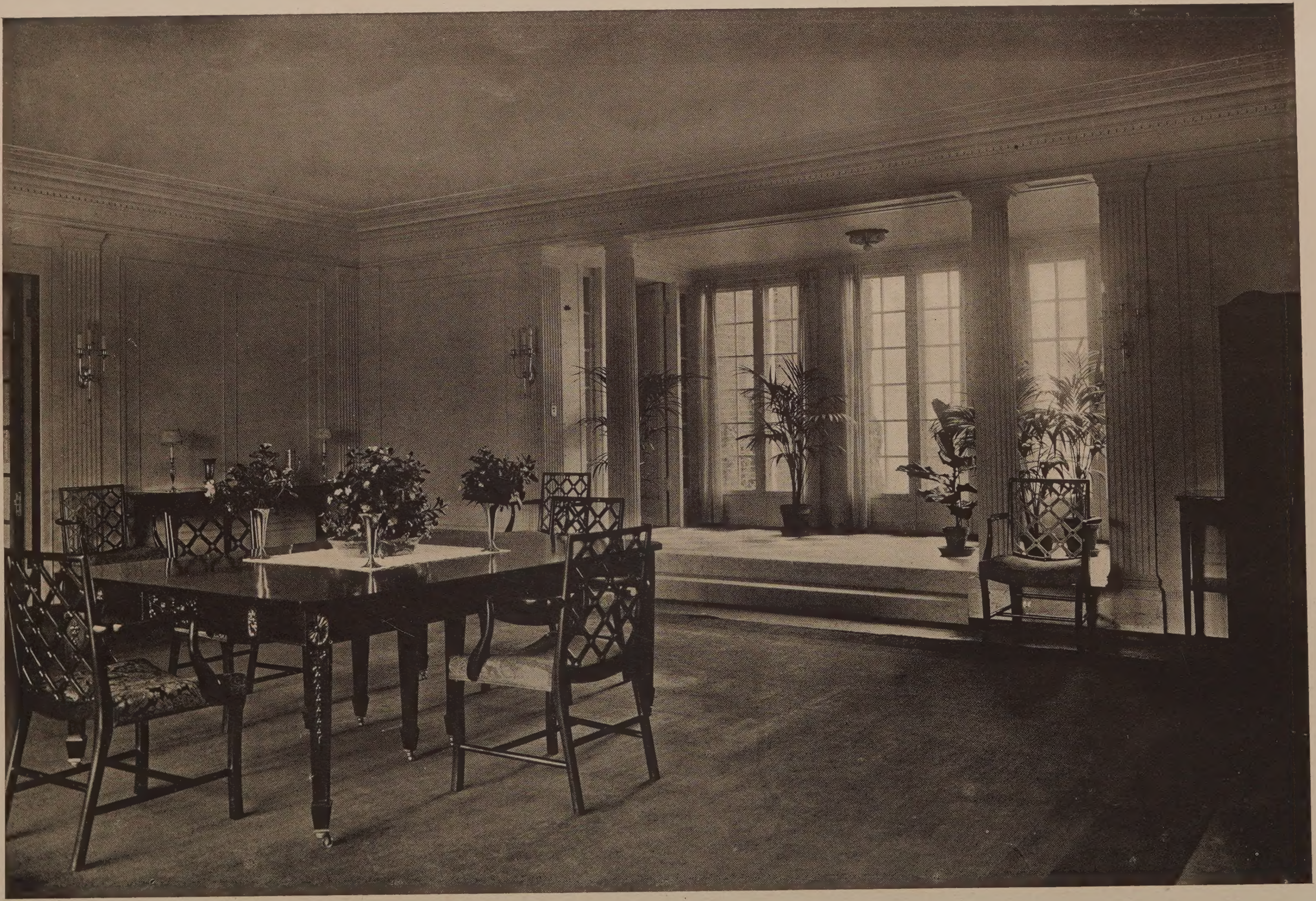


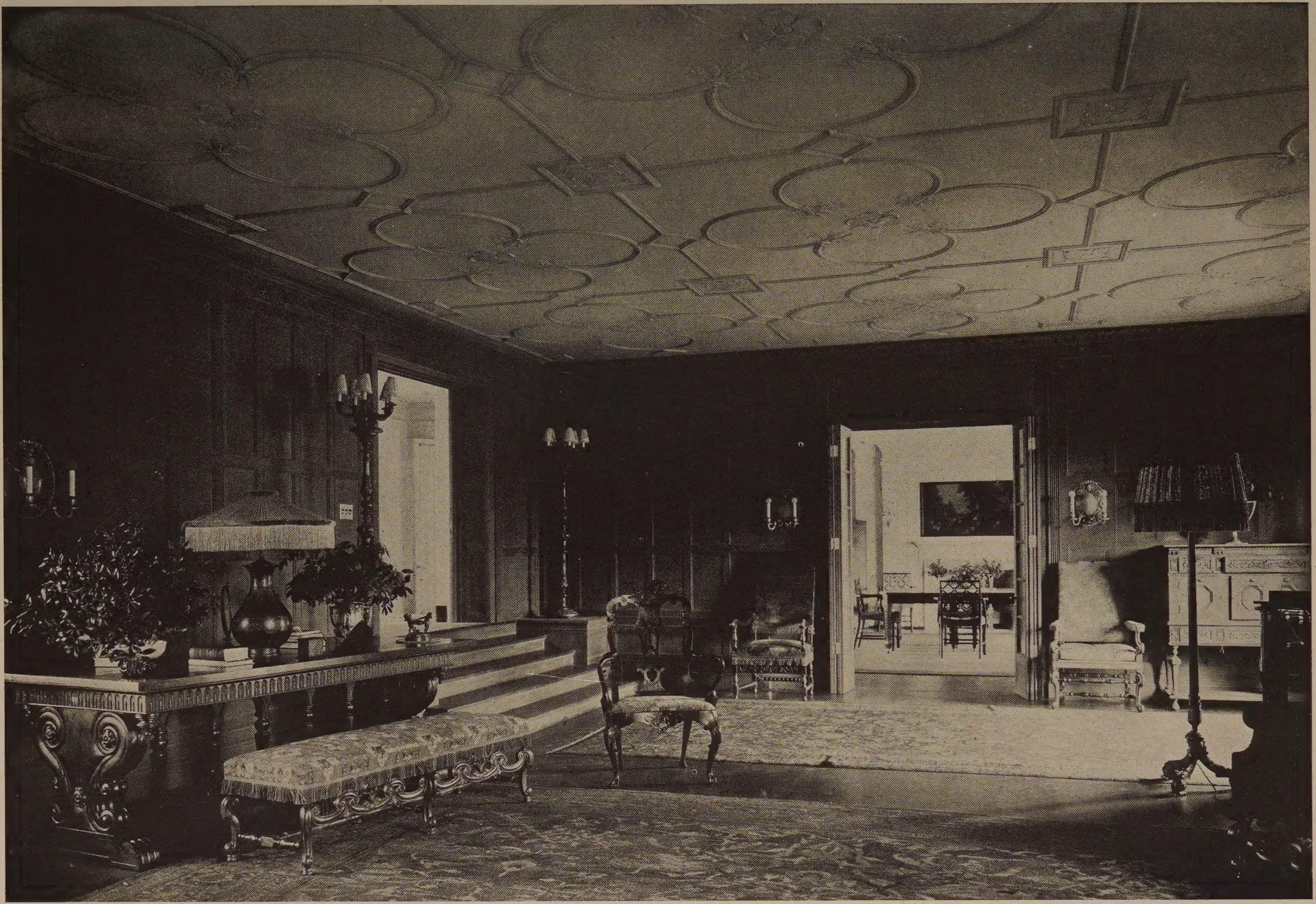
SOUTH FRONT, HOUSE, H. L. BATTERMAN, MILL NECK, L. I.

Designed by H T. Lindeberg, Albro & Lindeberg, Architects.



DINING ROOM, HOUSE, H. L. BATTERMAN, MILL NECK, L. I.

Designed by H. T. Lindeberg, Albro & Lindeberg, Architects.



LIVING ROOM, HOUSE, H. L. BATTERMAN, MILL NECK, L. I.

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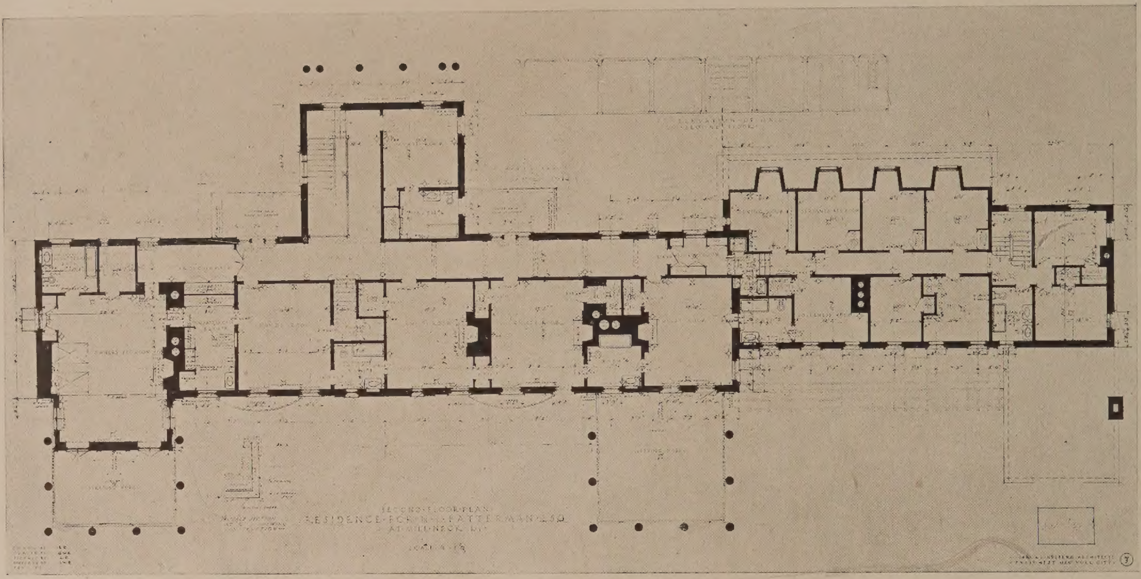
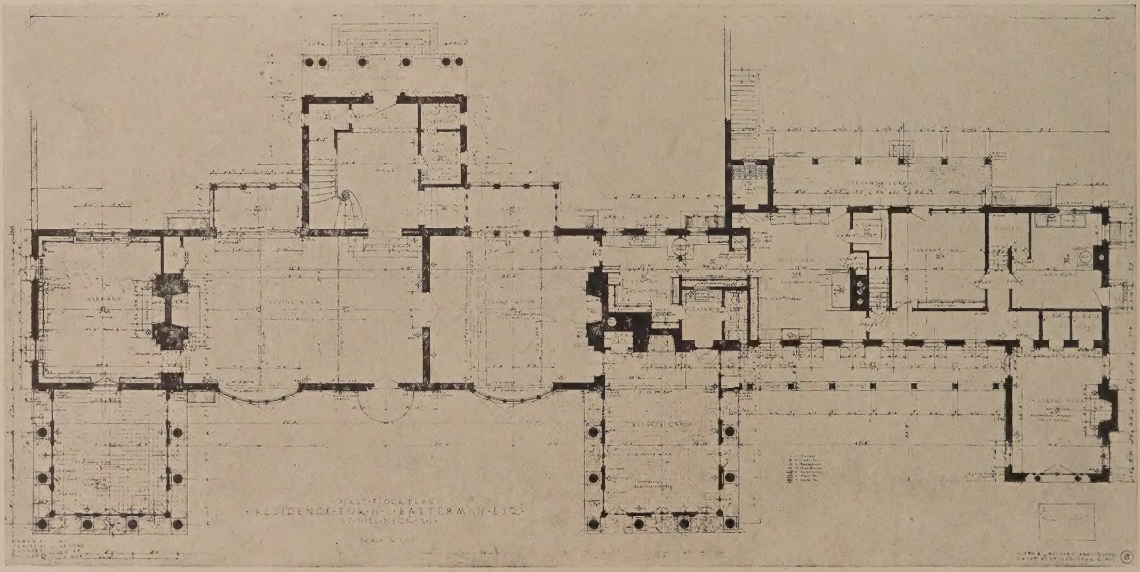
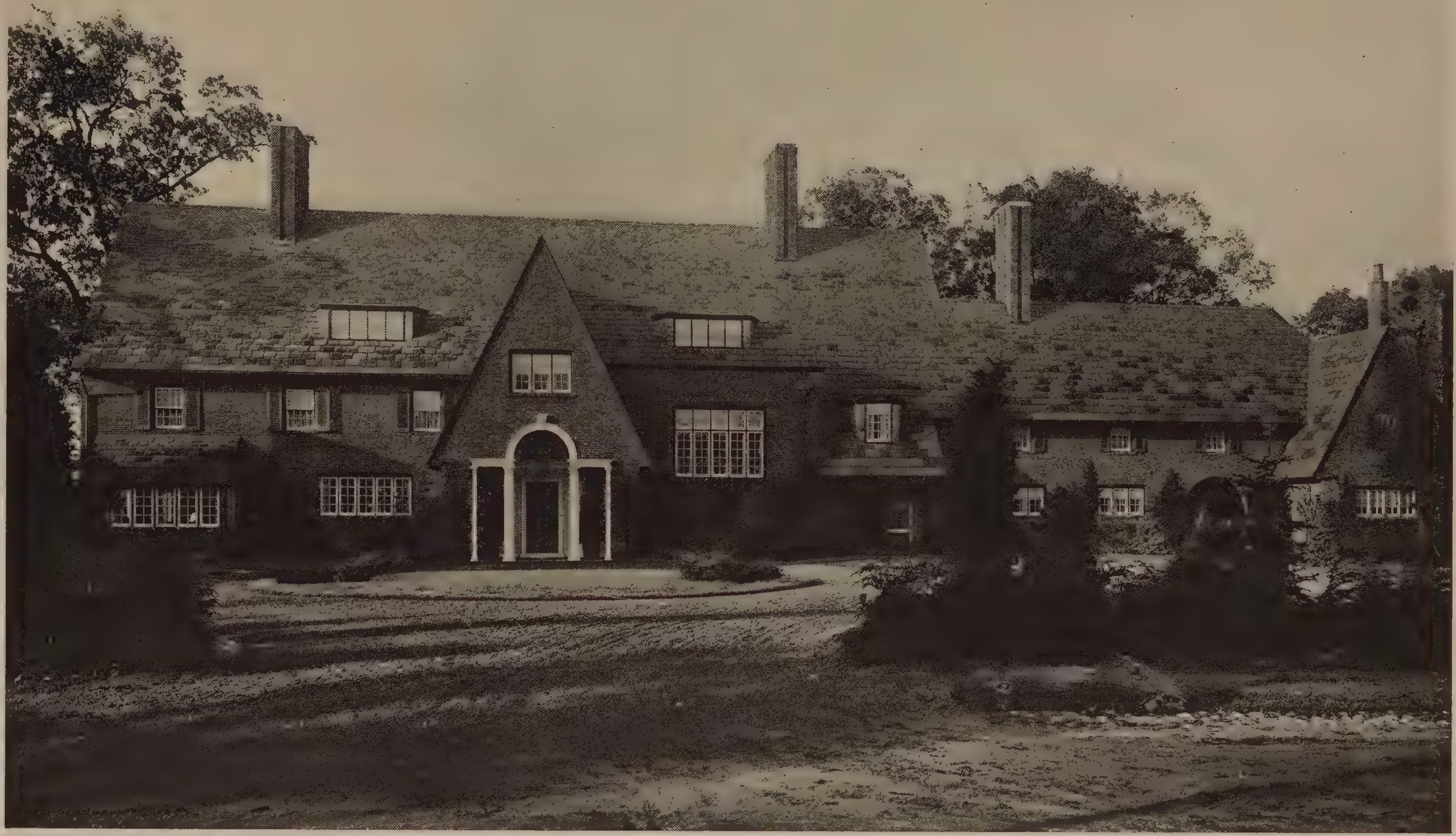




PLANS, HOUSE, H. L. BATTERMAN, MILL NECK, L. I. Designed by H. T. Lindeberg, Albro & Lindeberg, Architects.



HOUSE, JOHN T. GILLESPIE, MORRISTOWN, N. J

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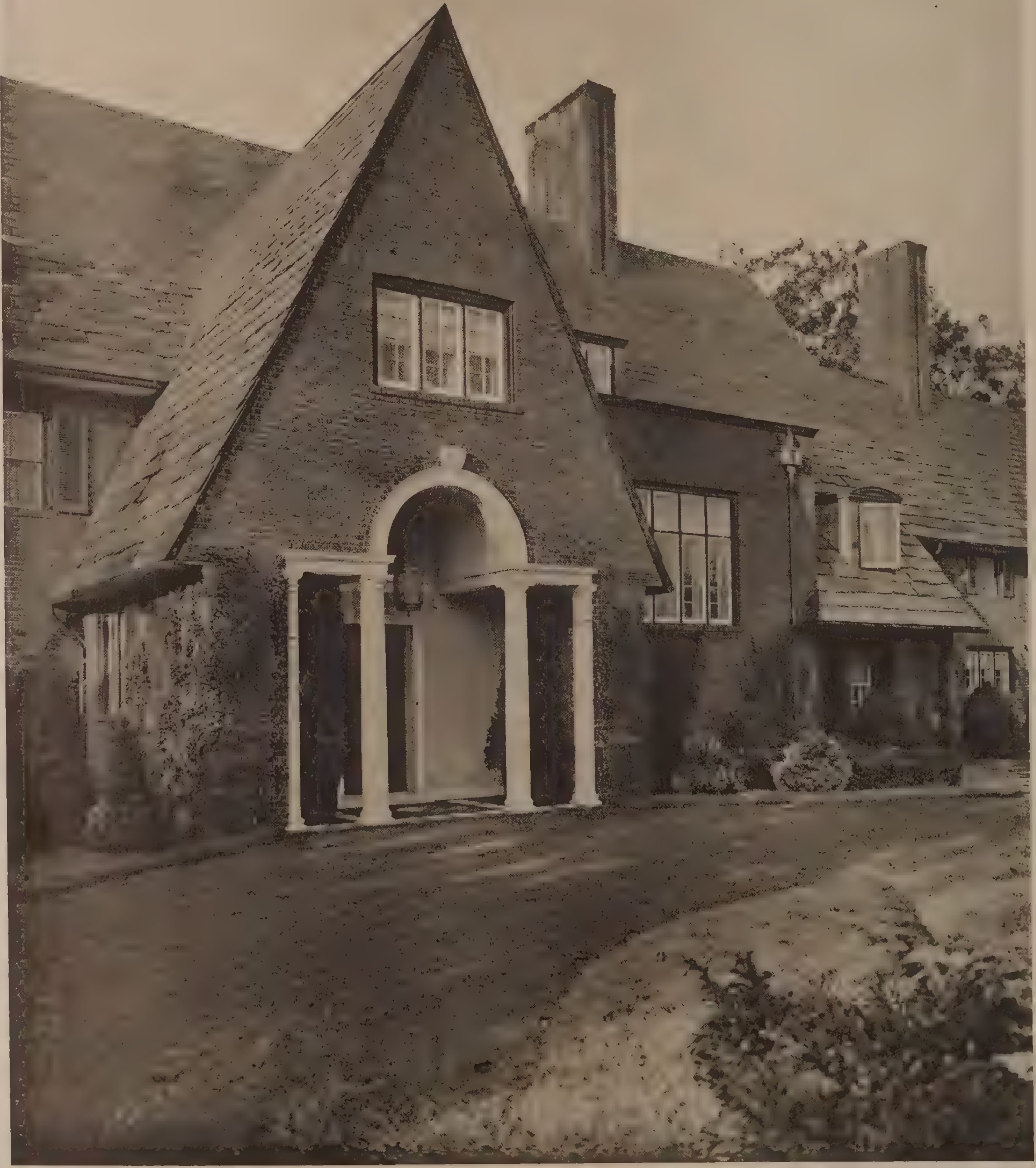

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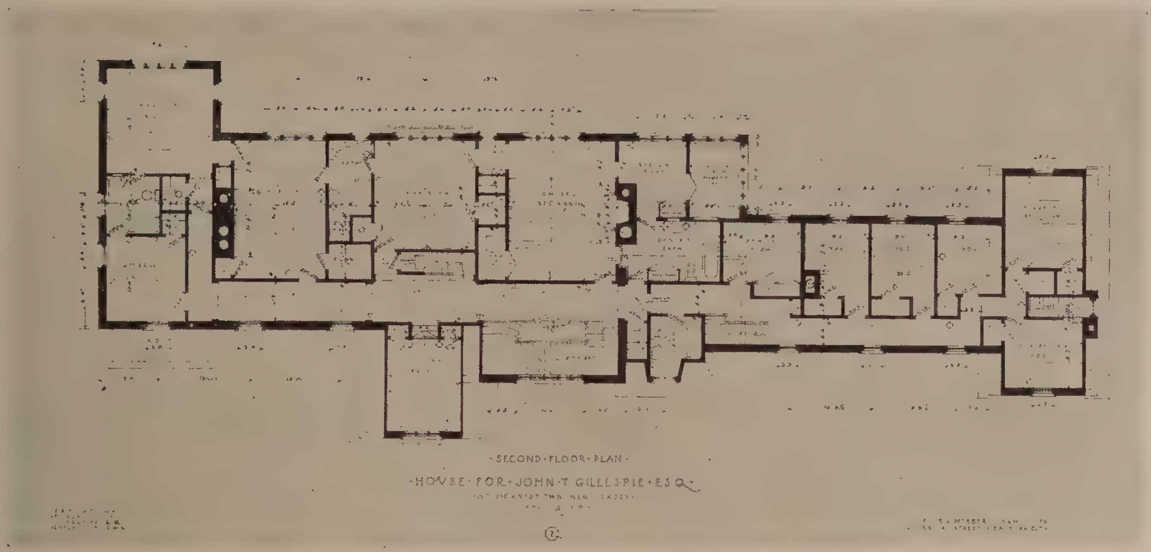

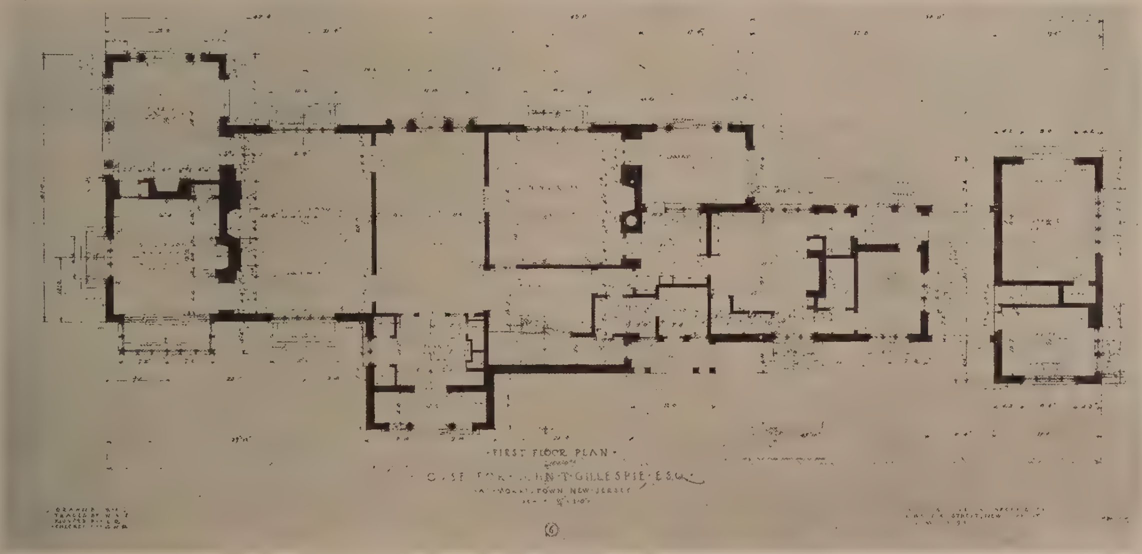

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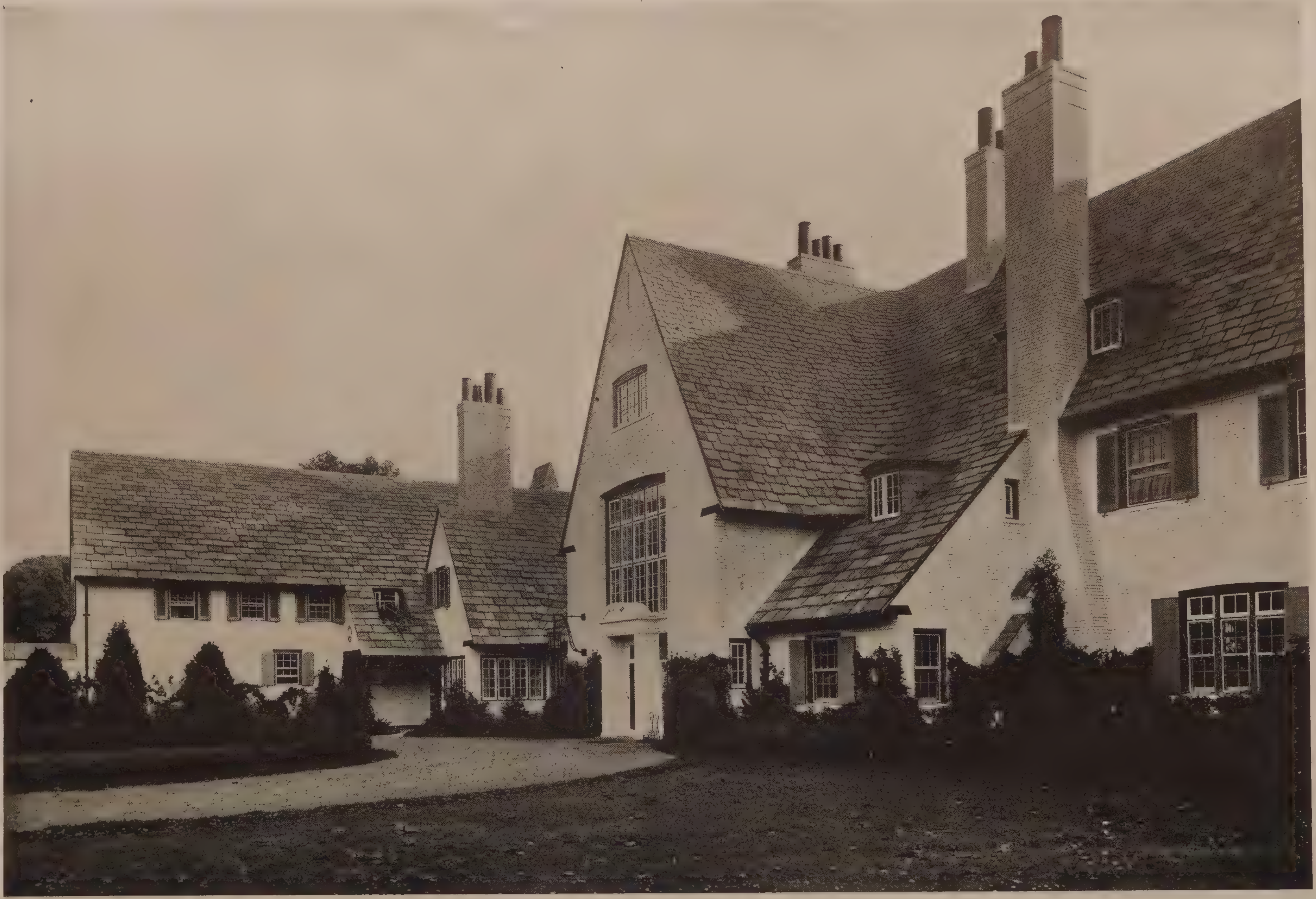

HOUSE, PAUL MOORE, CONVENT, N. J.

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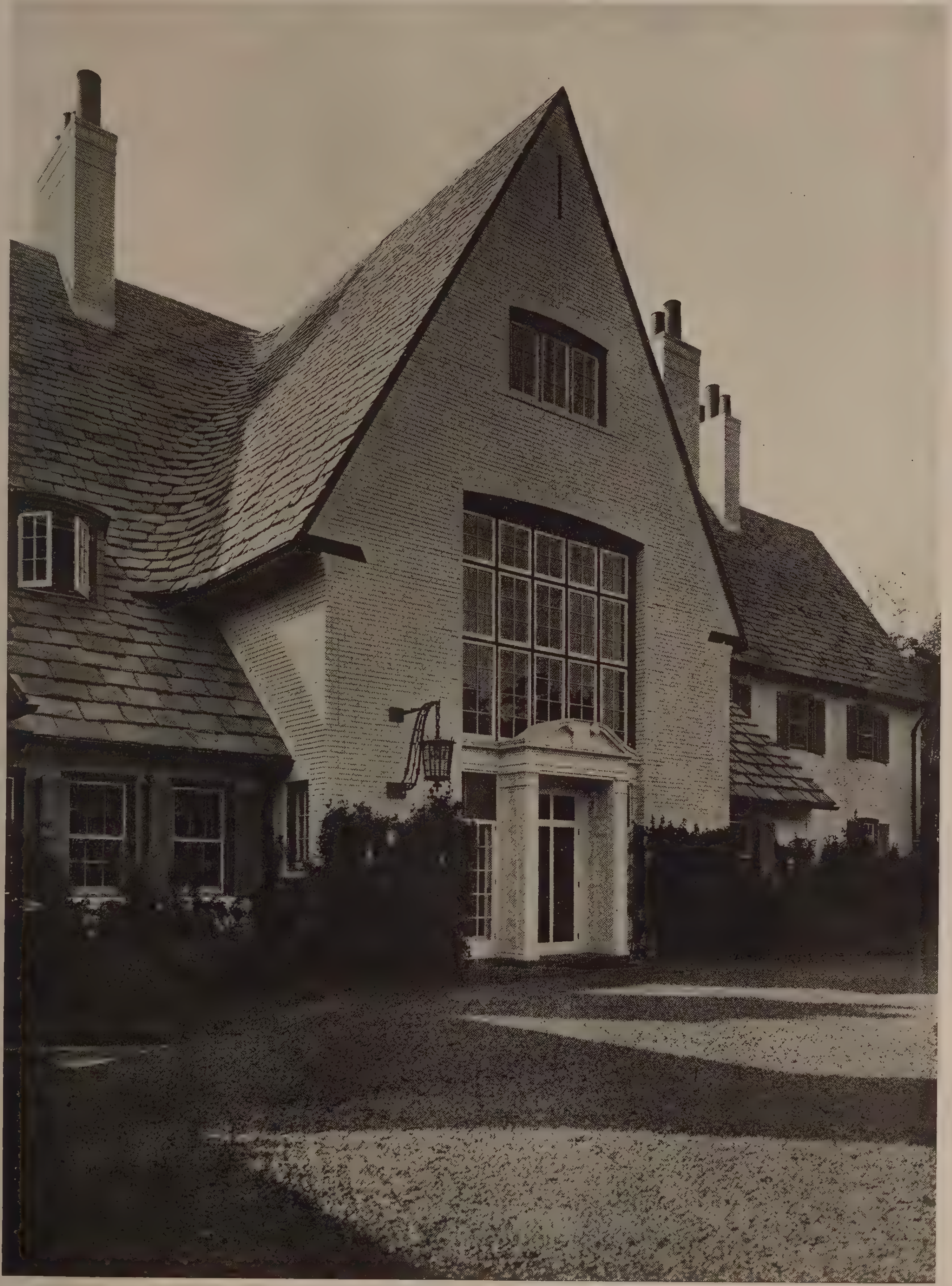

DETAIL, ENTRANCE, HOUSE, PAUL MOORE, CONVENT, N. J.

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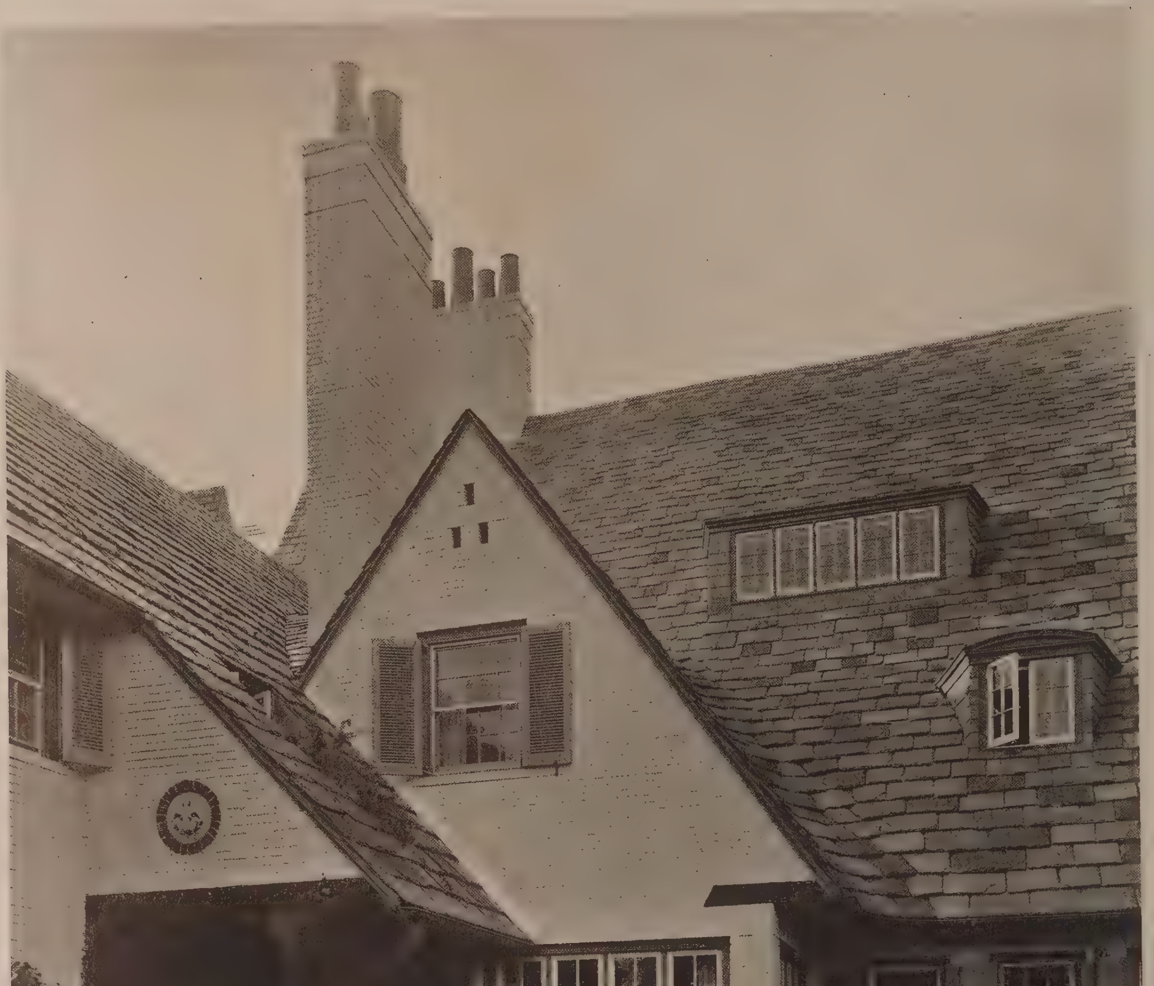
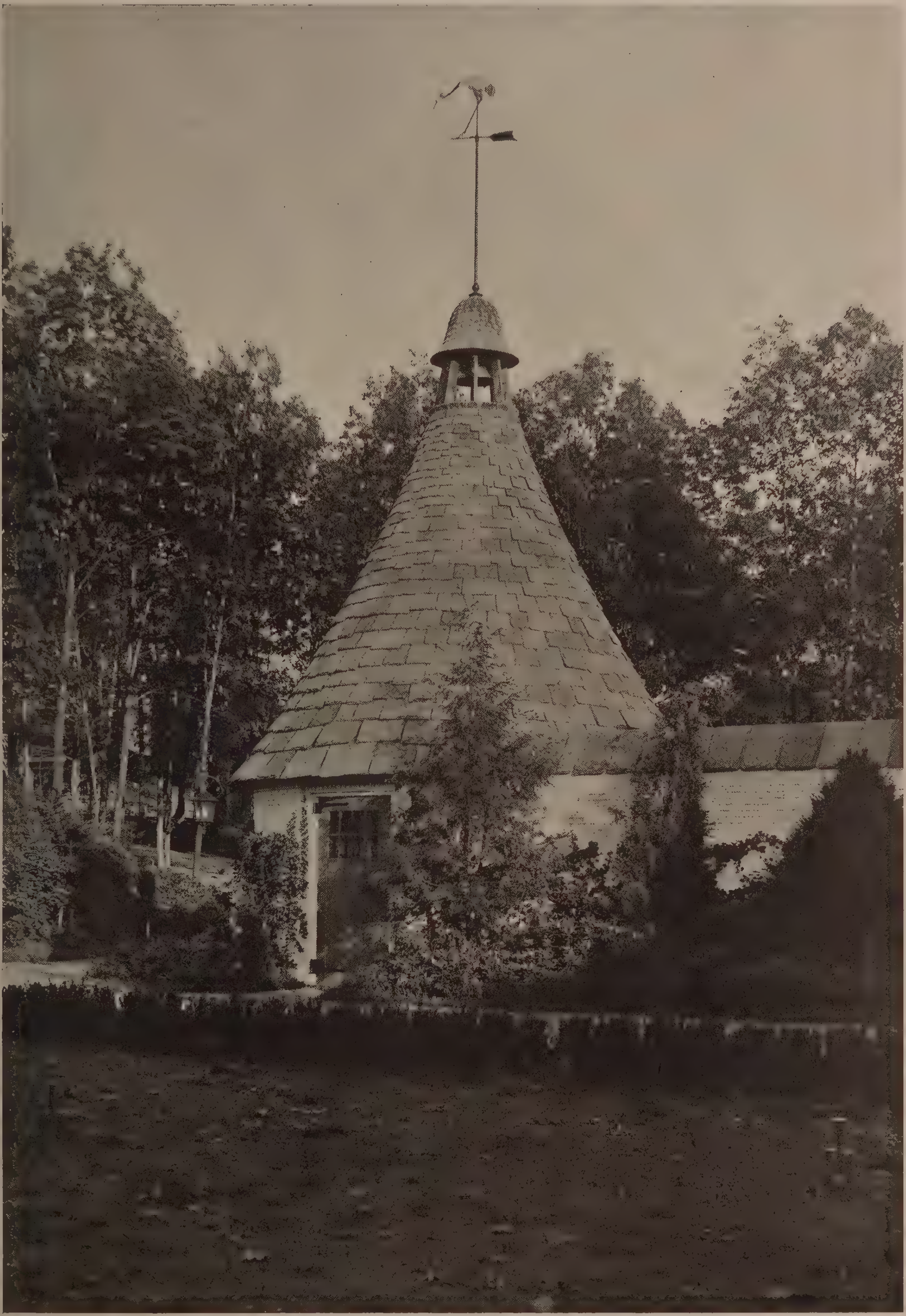


CHILDREN'S ENTRANCE, HOUSE, PAUL MOORE, CONVENT, N. J. Designed by H T. Lindeberg, Albro & Lindeberg, Architects.



BELL TOWER, PAUL MOORE, CONVENT, N. J.

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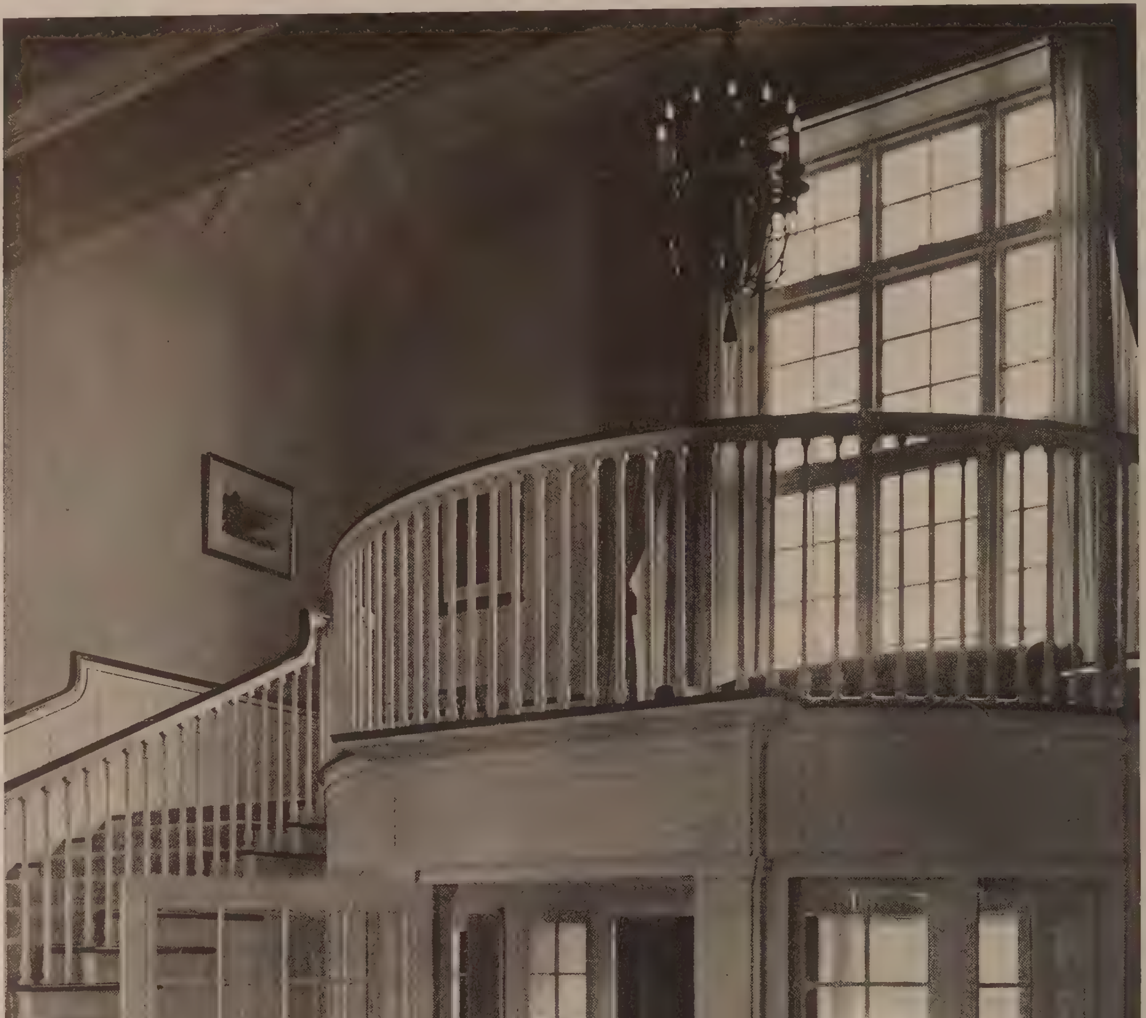

ENTRANCE HALL, HOUSE, PAUL MOORE, CONVENT, N. J.

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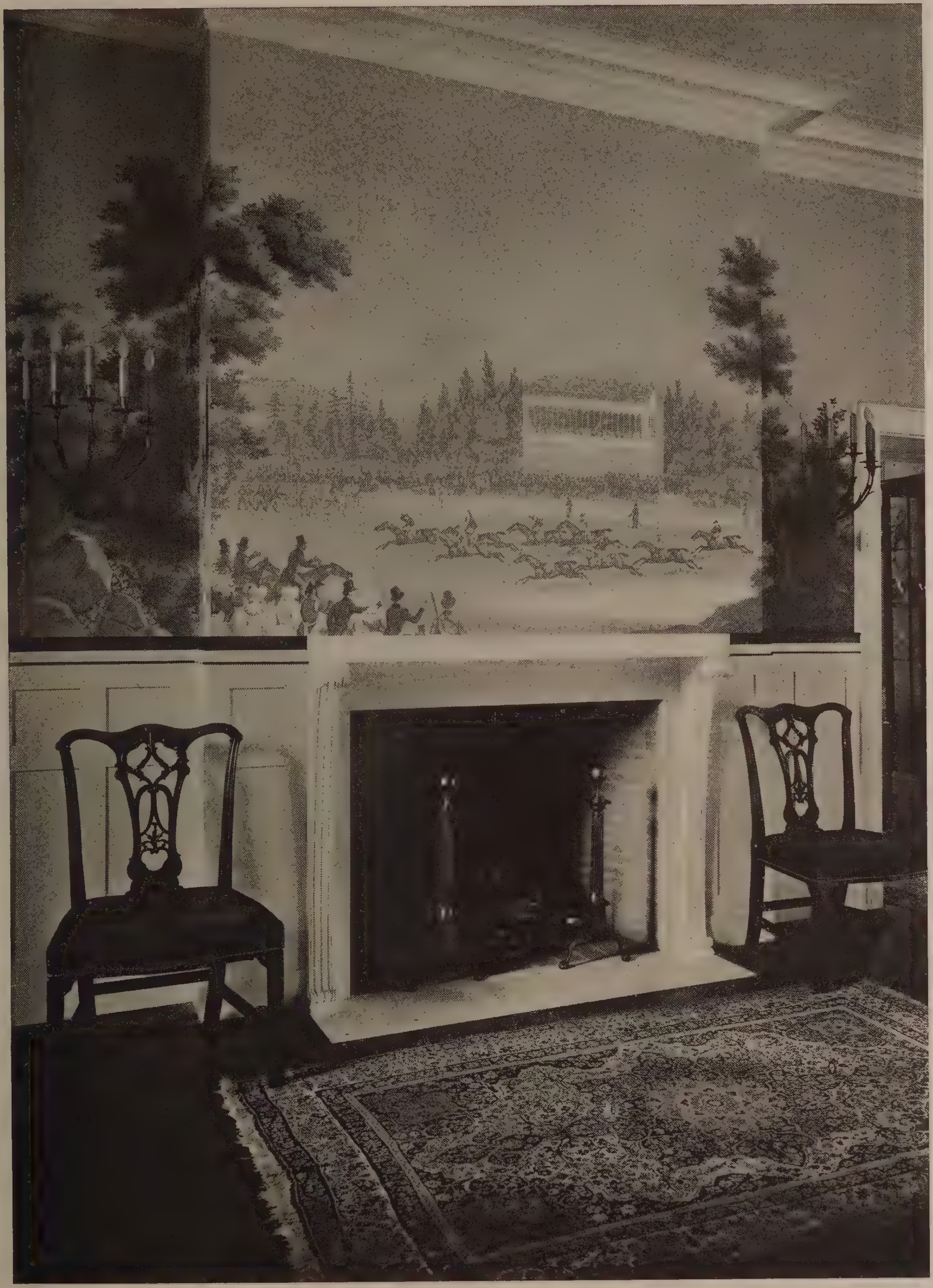

HALL MANTEL, HOUSE, PAUL MOORE, CONVENT, N. J.

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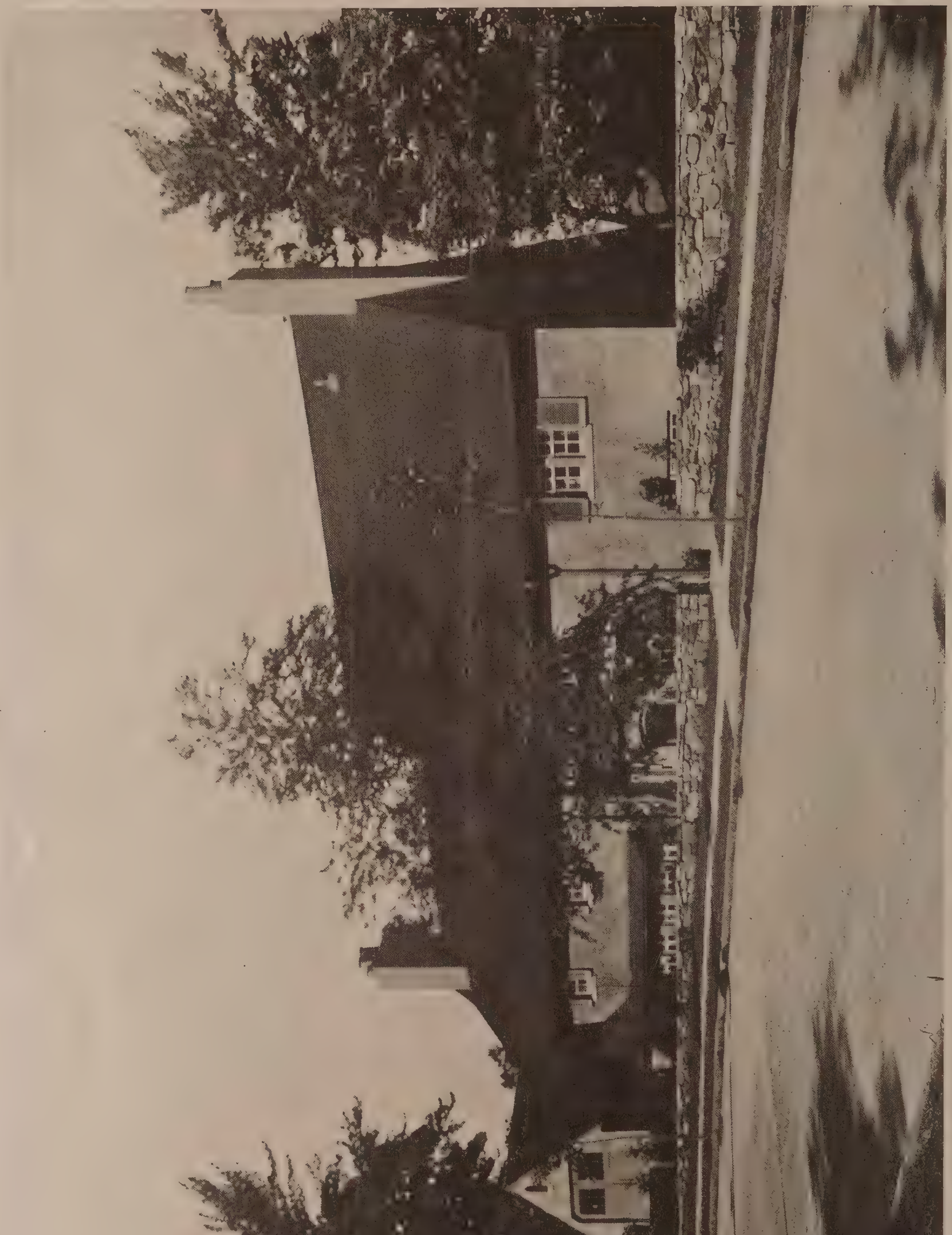

HOUSE, CLAYTON COOPER, RIVERDALE, N. Y.

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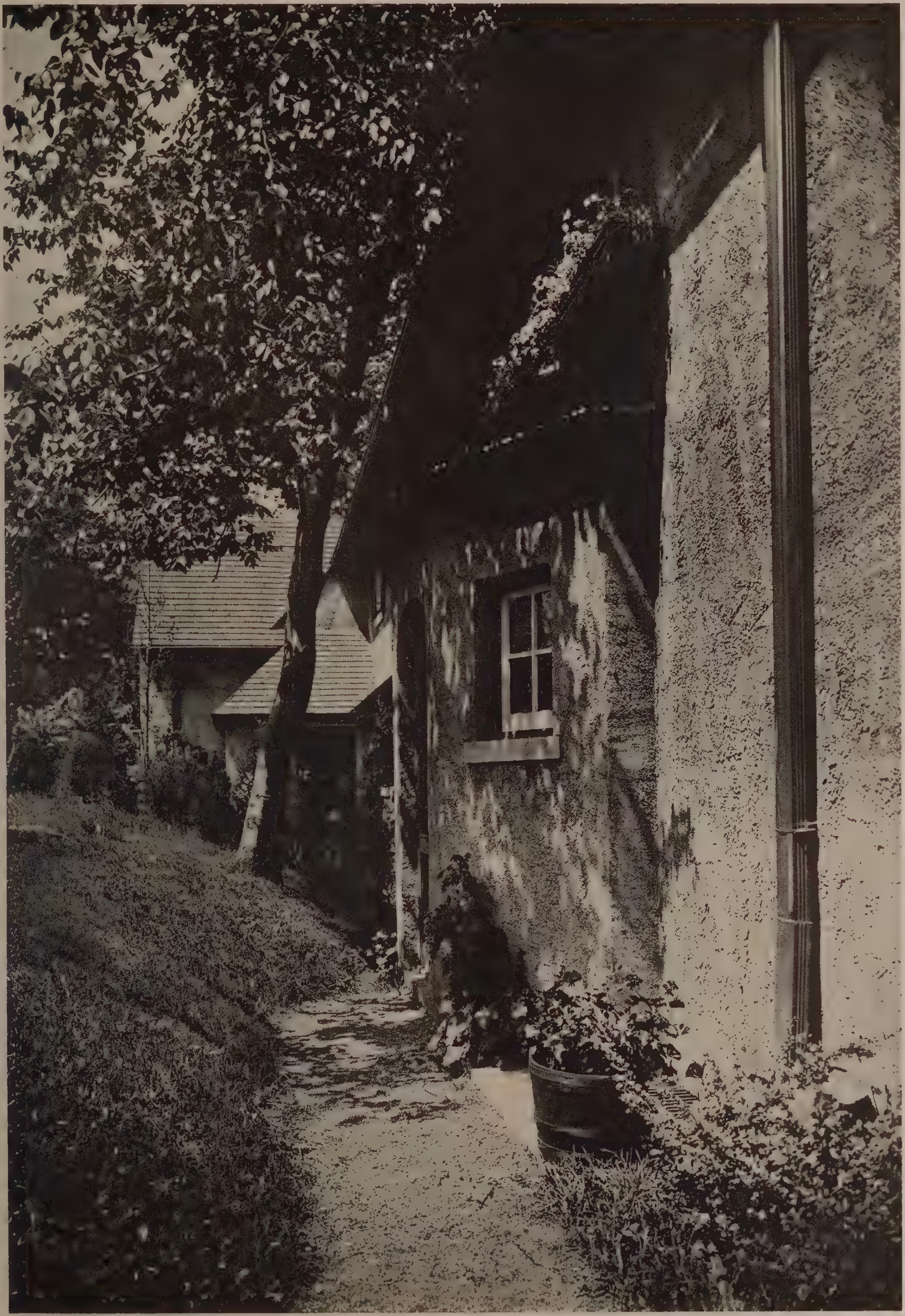
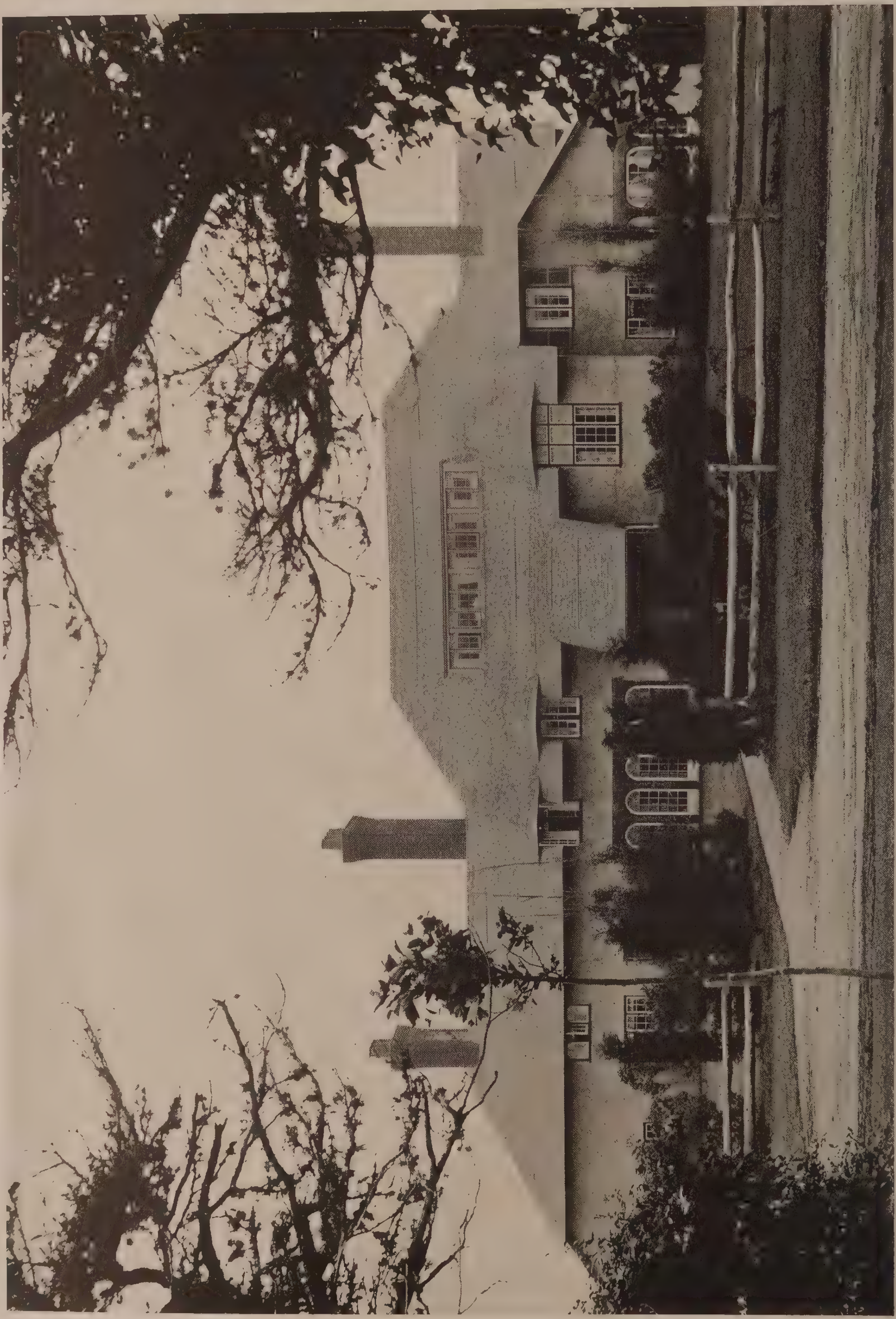


DETAIL, ENTRANCE, HOUSE, CLAYTON COOPER, RIVERDALE, N. Y. Designed by H. T. Lindeberg, Albro & Lindeberg, Architects.



HOUSE, DR. JOHN E. ERDMAN, EAST HAMPTON, L. I.

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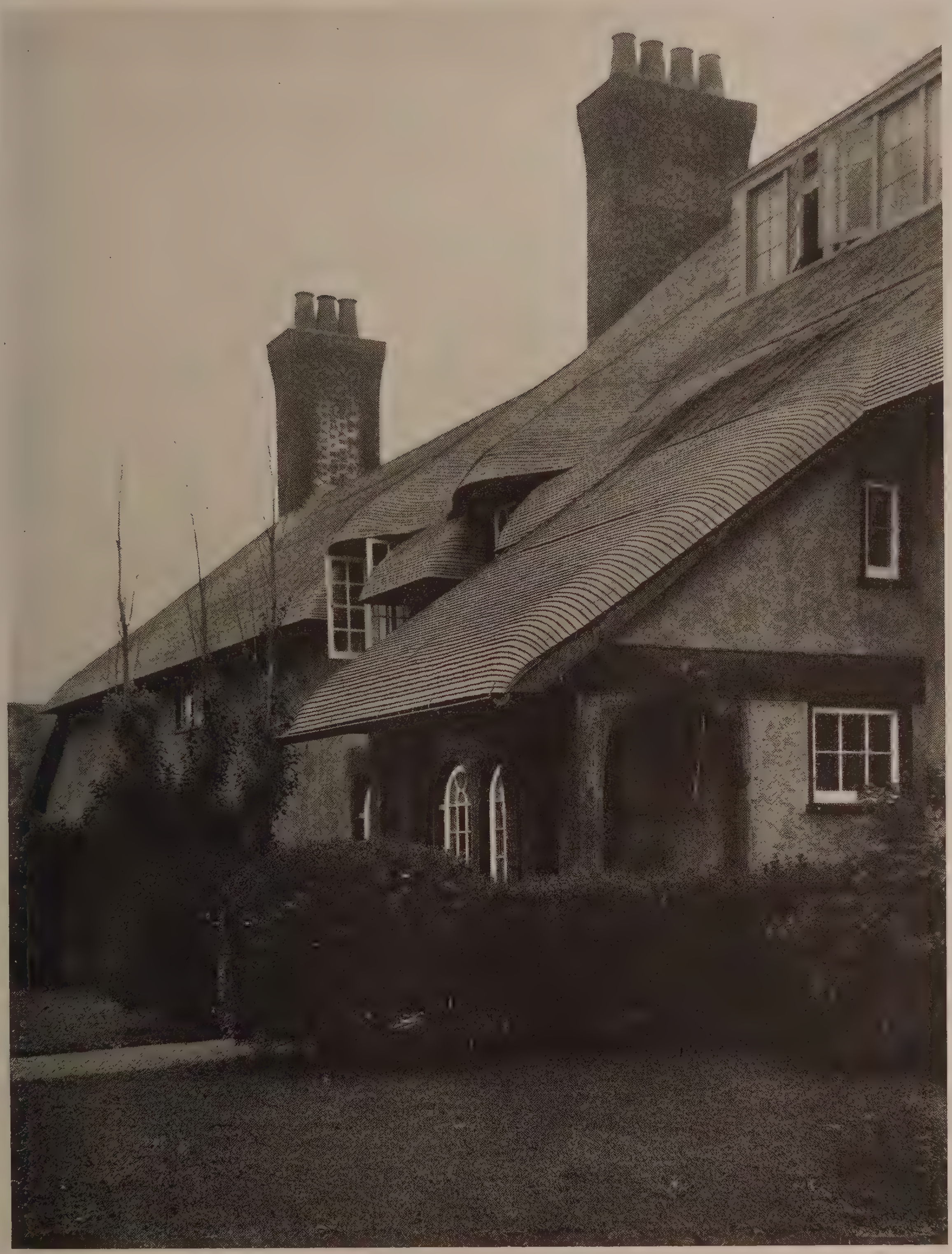
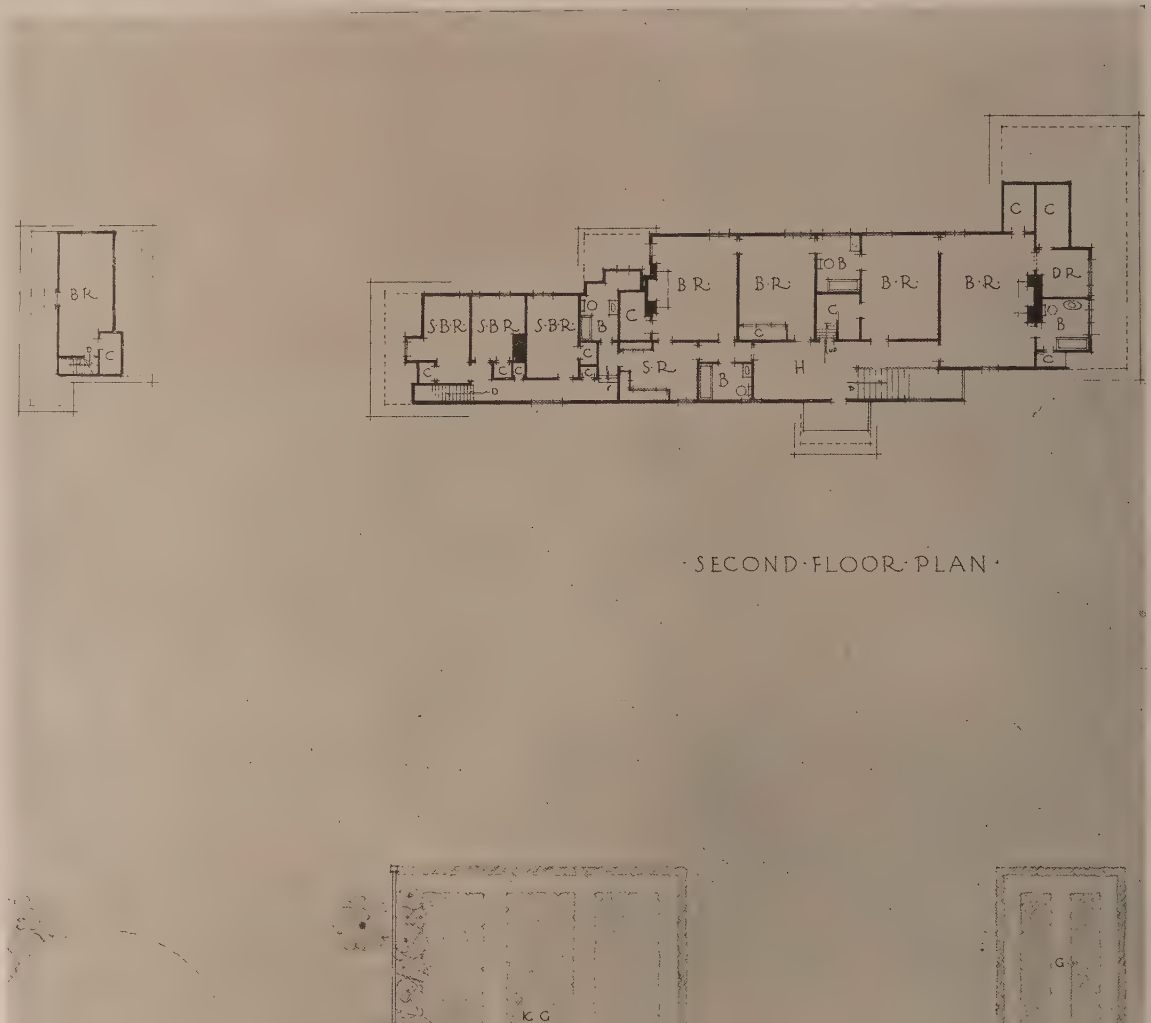
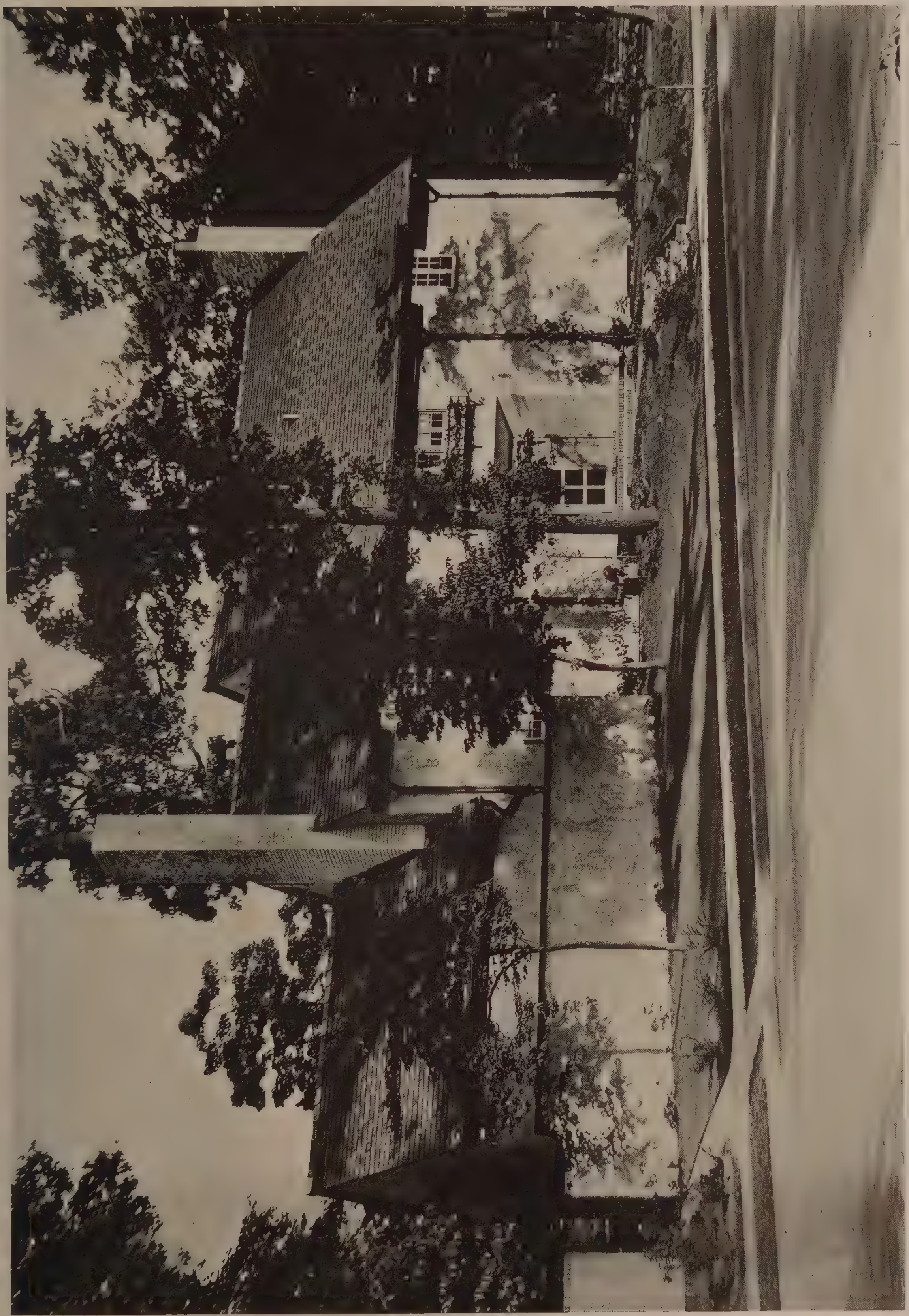


DETAIL, ENTRANCE, HOUSE, DR. JOHN E. ERDMAN, EAST HAMPTON, L. I. Designed by H. T. Lindeberg, Albro & Lindeberg, Architects.



PLANS, HOUSE, DR. JOHN E. ERDMAN, EAST HAMPTON, L. I. Designed by H. T. Lindeberg, Albro & Lindeberg, Architects.



HOUSE, BOARDMAN ROBINSON, FOREST HILLS, L. I.

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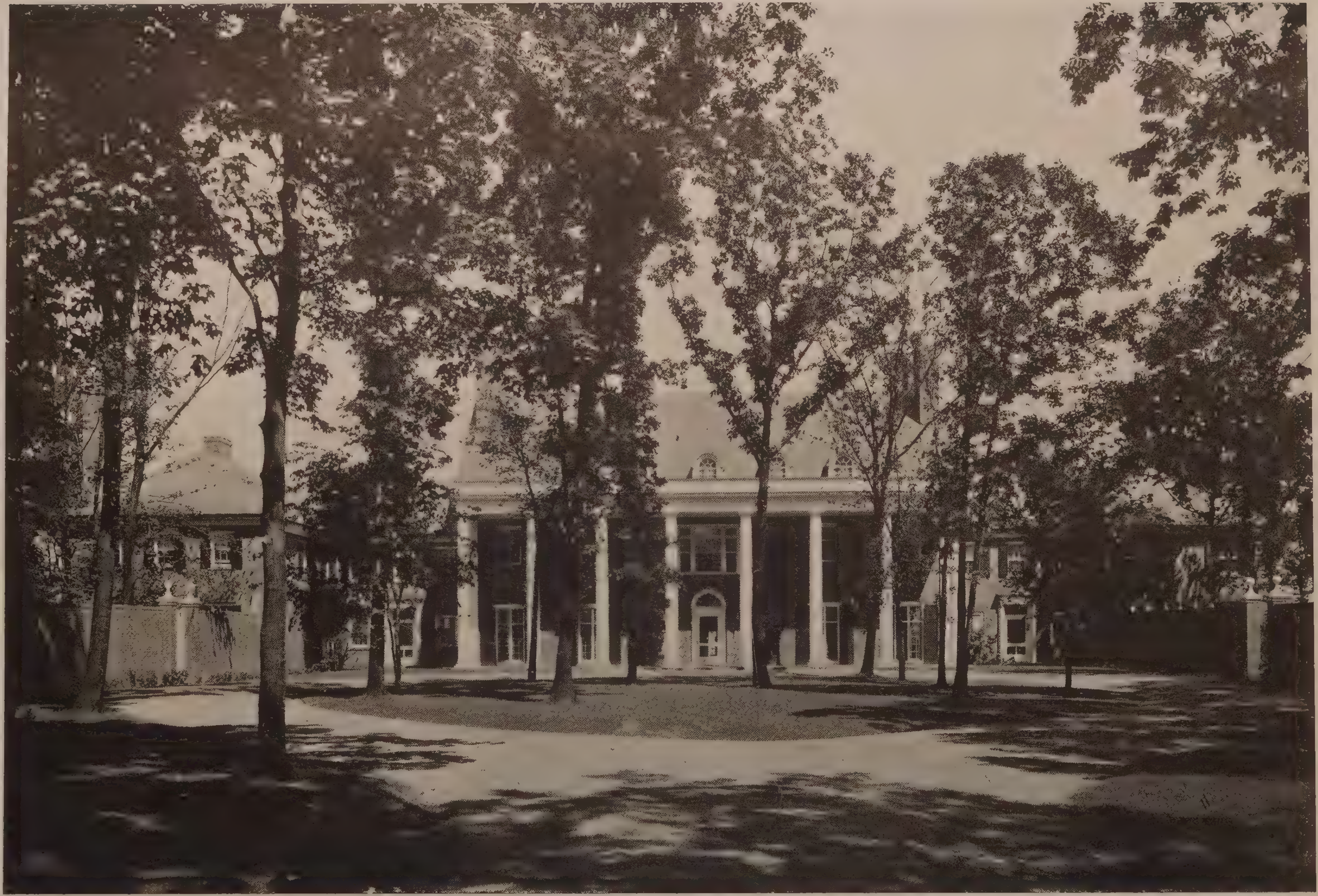
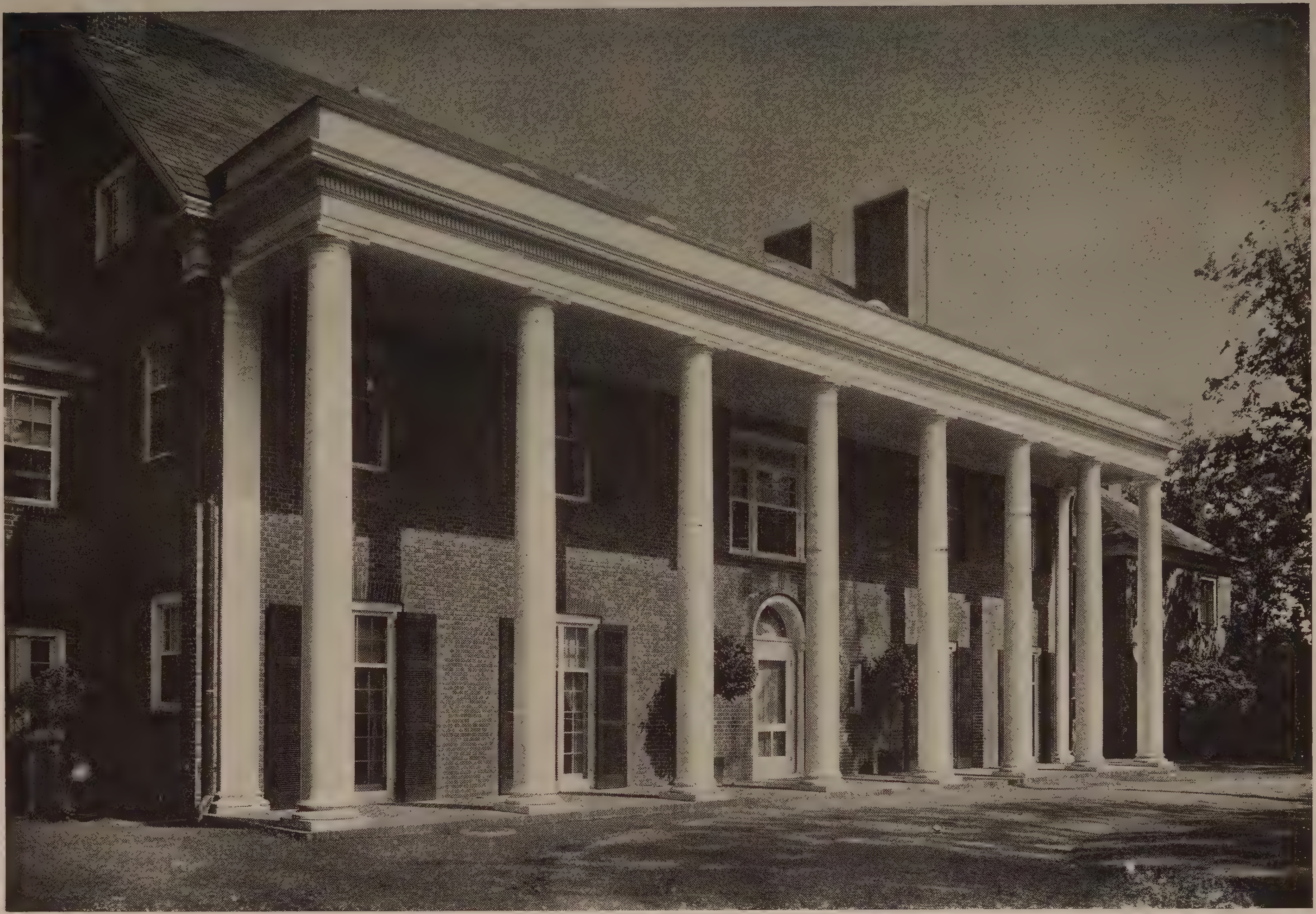


HOUSE, A. A. SPRAGUE II, LAKE FOREST, ILL.

Designed by H. T. Lindeberg, Albro & Lindeberg, Architects.



DETAIL, HOUSE, A. A. SPRAGUE II, LAKE FOREST, ILL.

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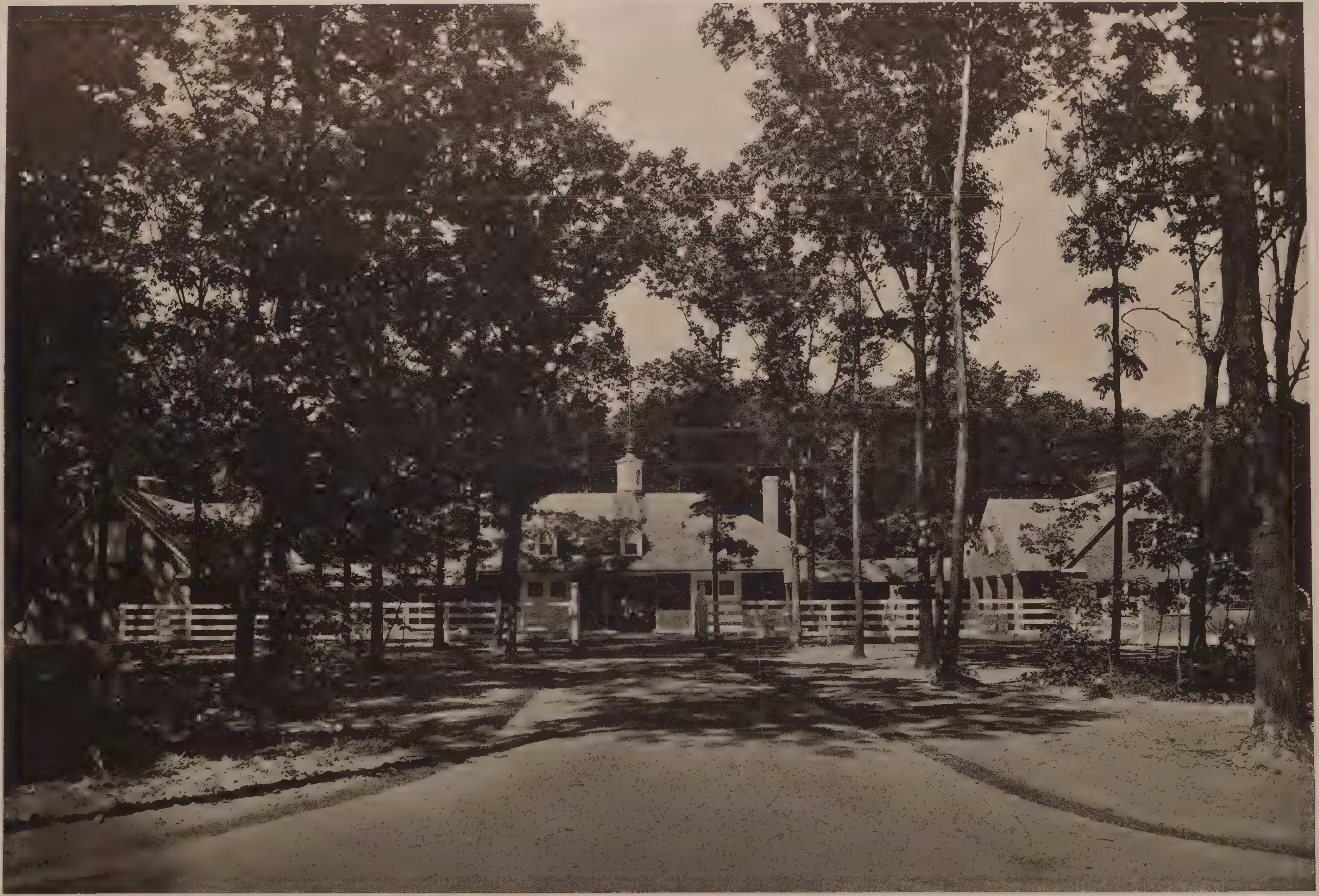
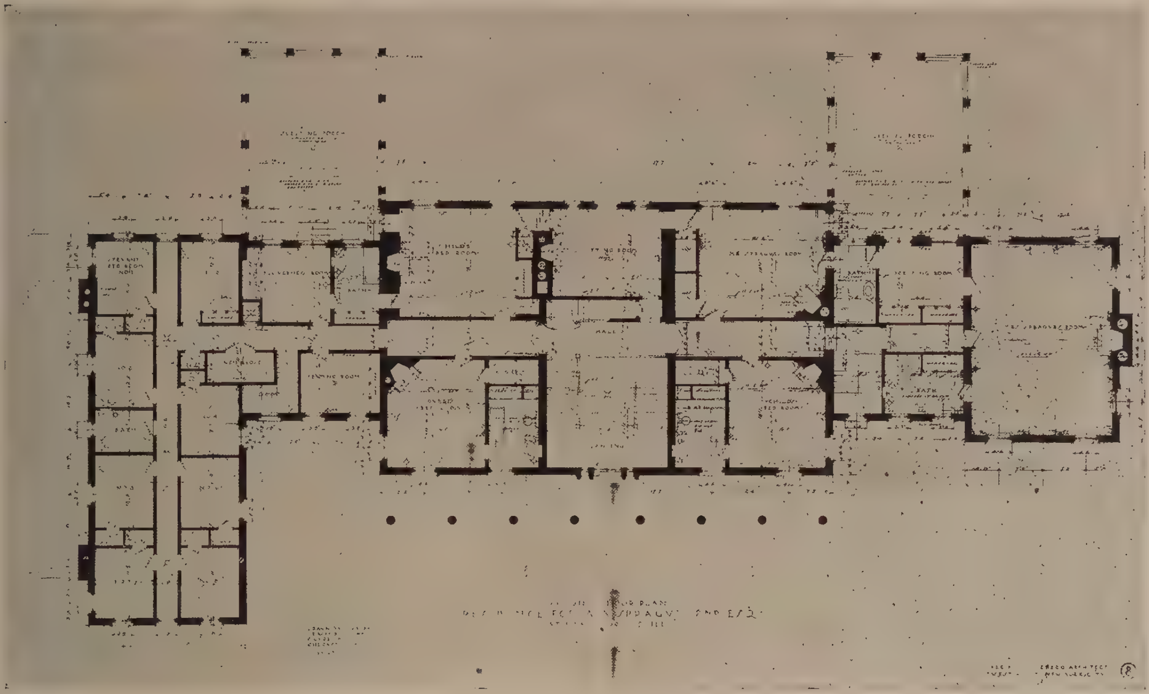
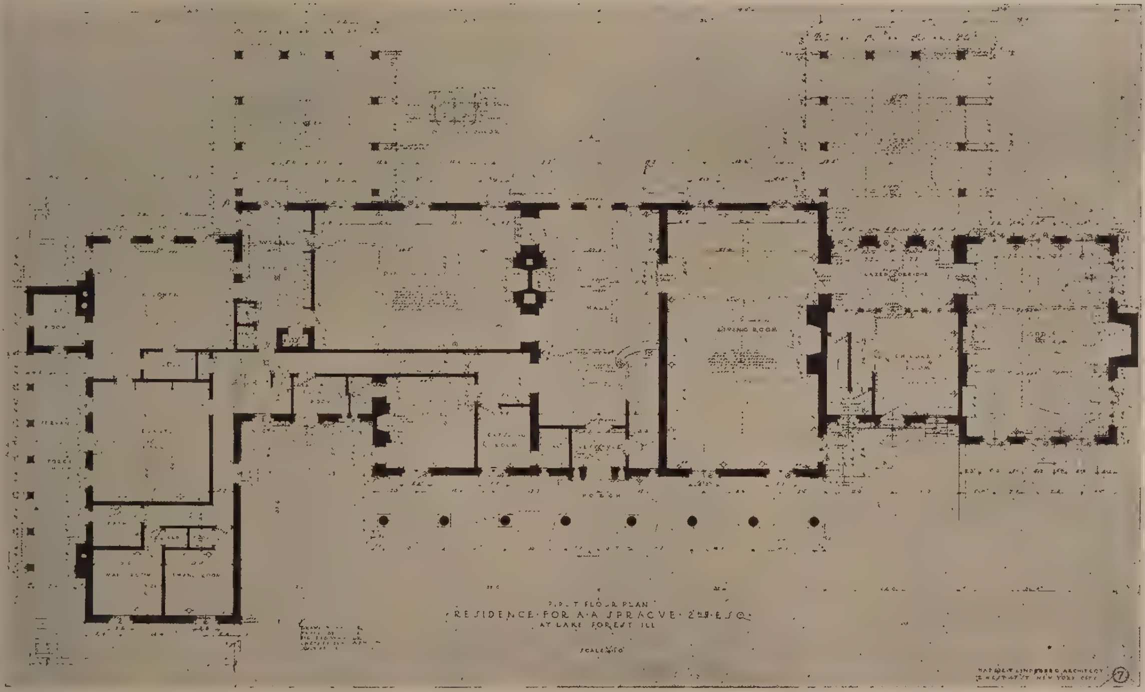


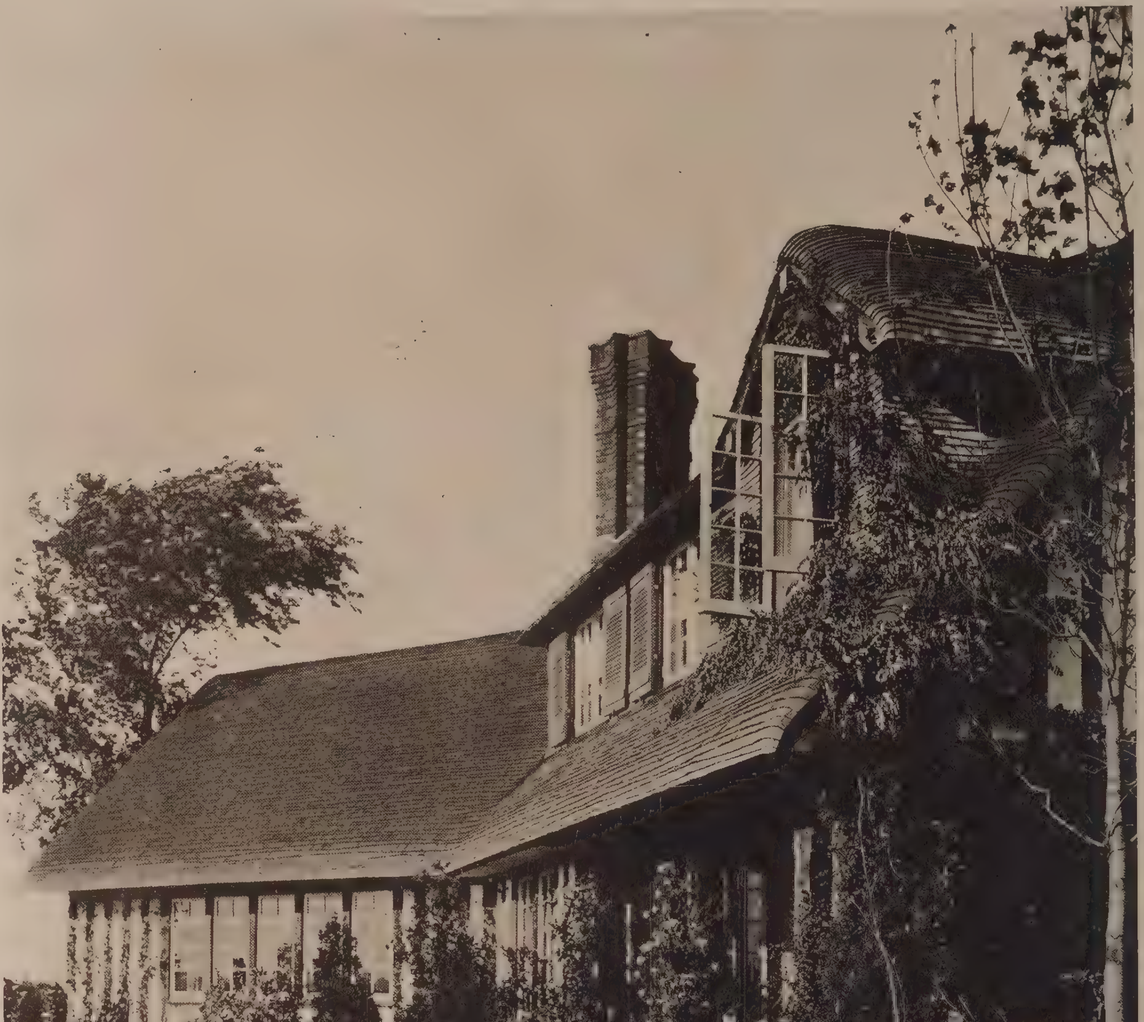
GARAGE AND COTTAGES, A. A. SPRAGUE II, LAKE FOREST, ILL.

Designed by H. T. Lindeberg, Albro & Lindeberg, Architects.

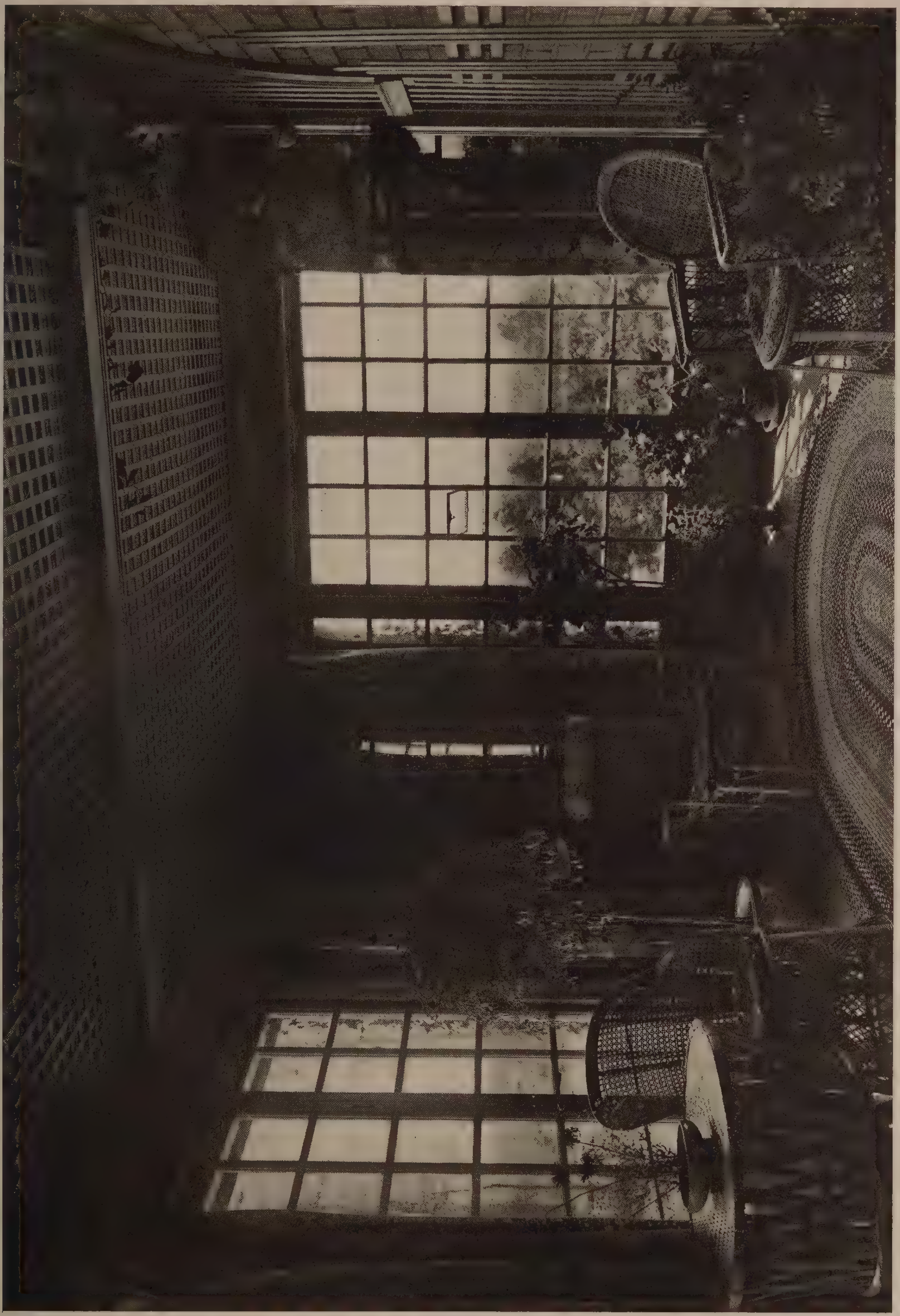




PLANS, HOUSE, A. A SPRAGUE II, LAKE FOREST, ILL. Designed by H T. Lindeberg, Albro & Lindeberg, Architects.



SOUTH FRONT, HOUSE, A. R. GARDNER, DUNWOODIE HEIGHTS, N. Y. Designed by H. T. Lindeberg, Albro & Lindeberg, Architects.



SUN PARLOR, HOUSE. DR. A. R. GARDNER, DUNWOODIE HEIGHTS, N. Y.

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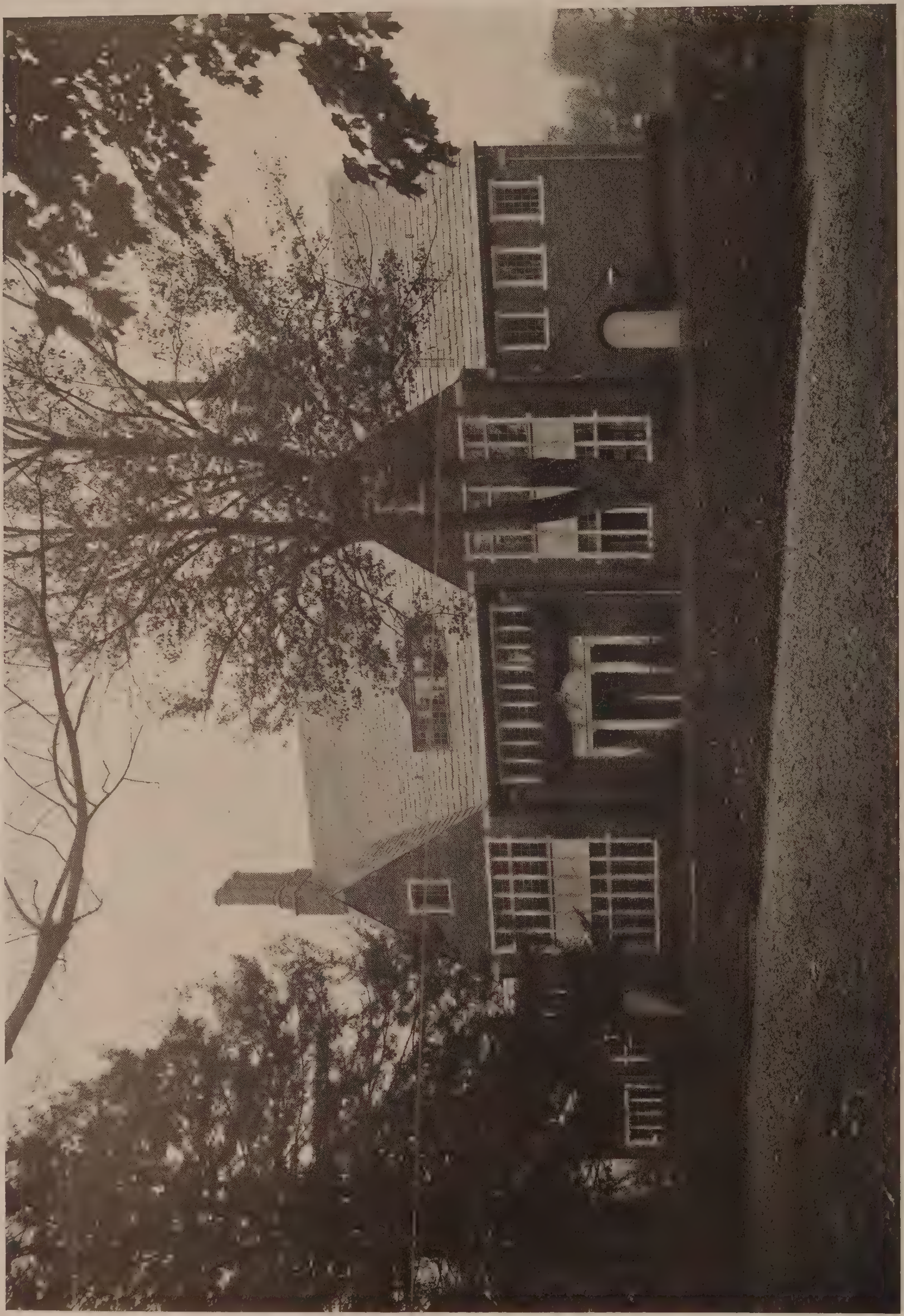
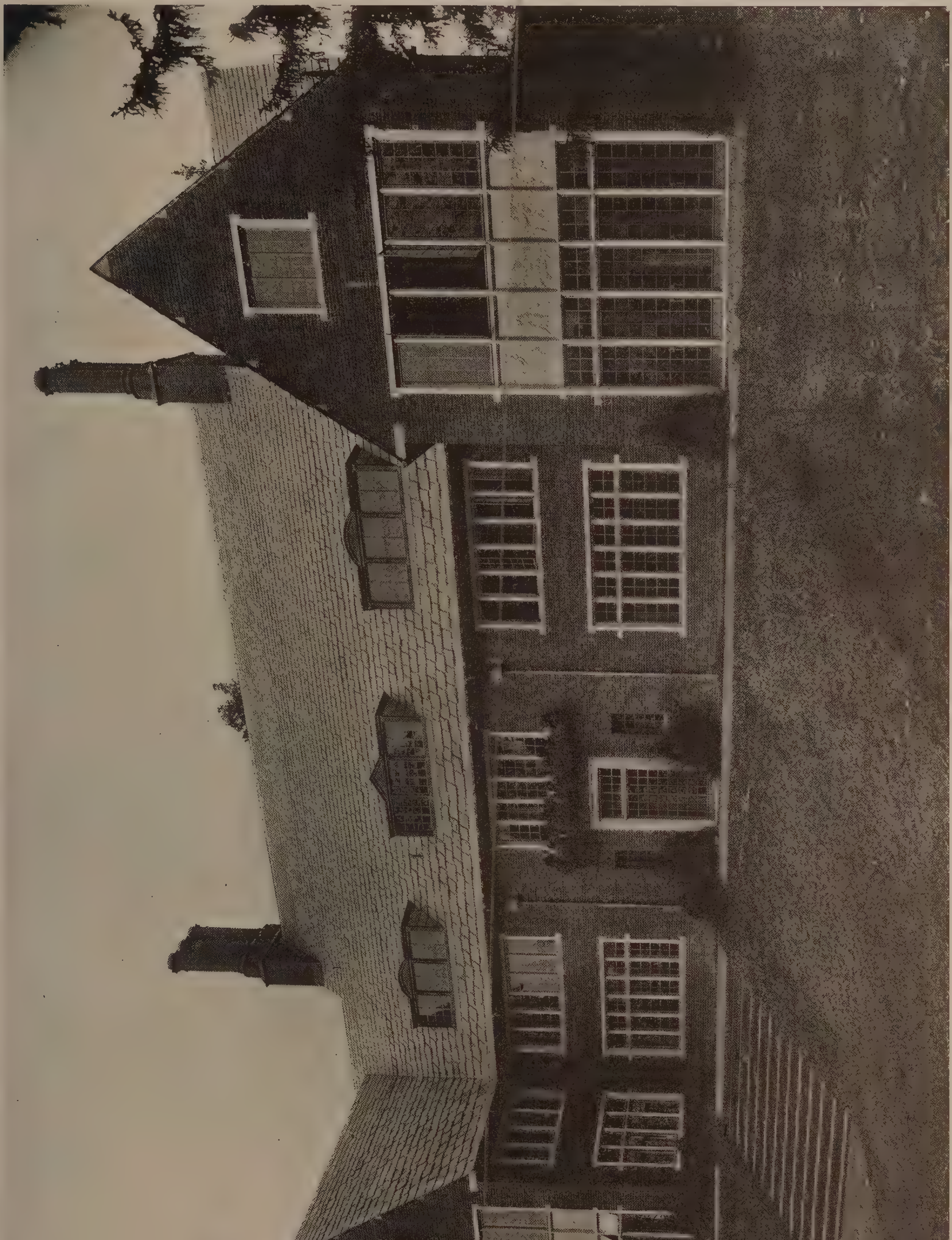


ENTRANCE FRONT, HOLIDAY FARM, ASTOR MEMORIAL, RHINEBECK, N. Y.

Designed by H. T. Lindeberg, Albro & Lindeberg, Architects.



SOUTH FRONT, HOLIDAY FARM, ASTOR MEMORIAL, RHINEBECK, N Y.

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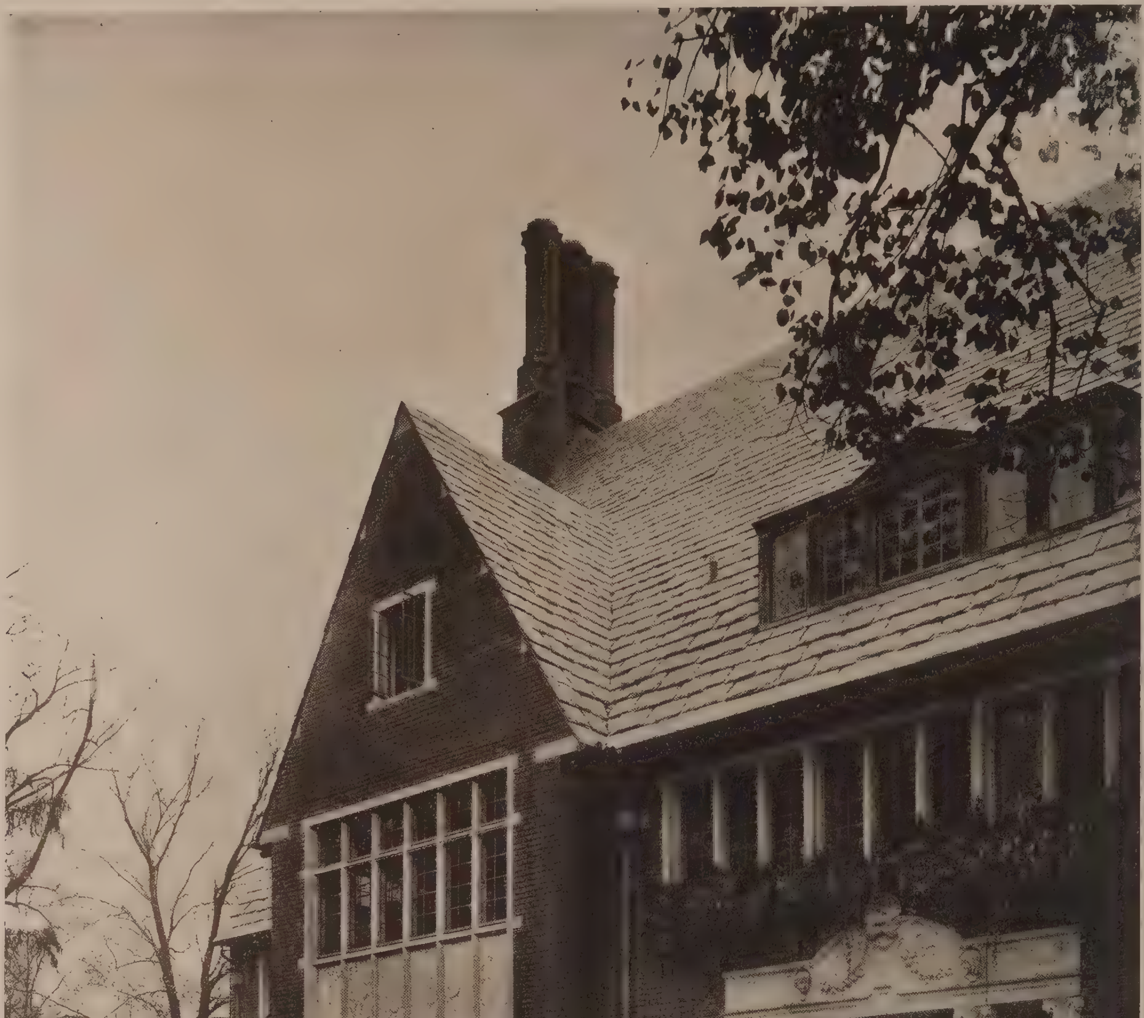
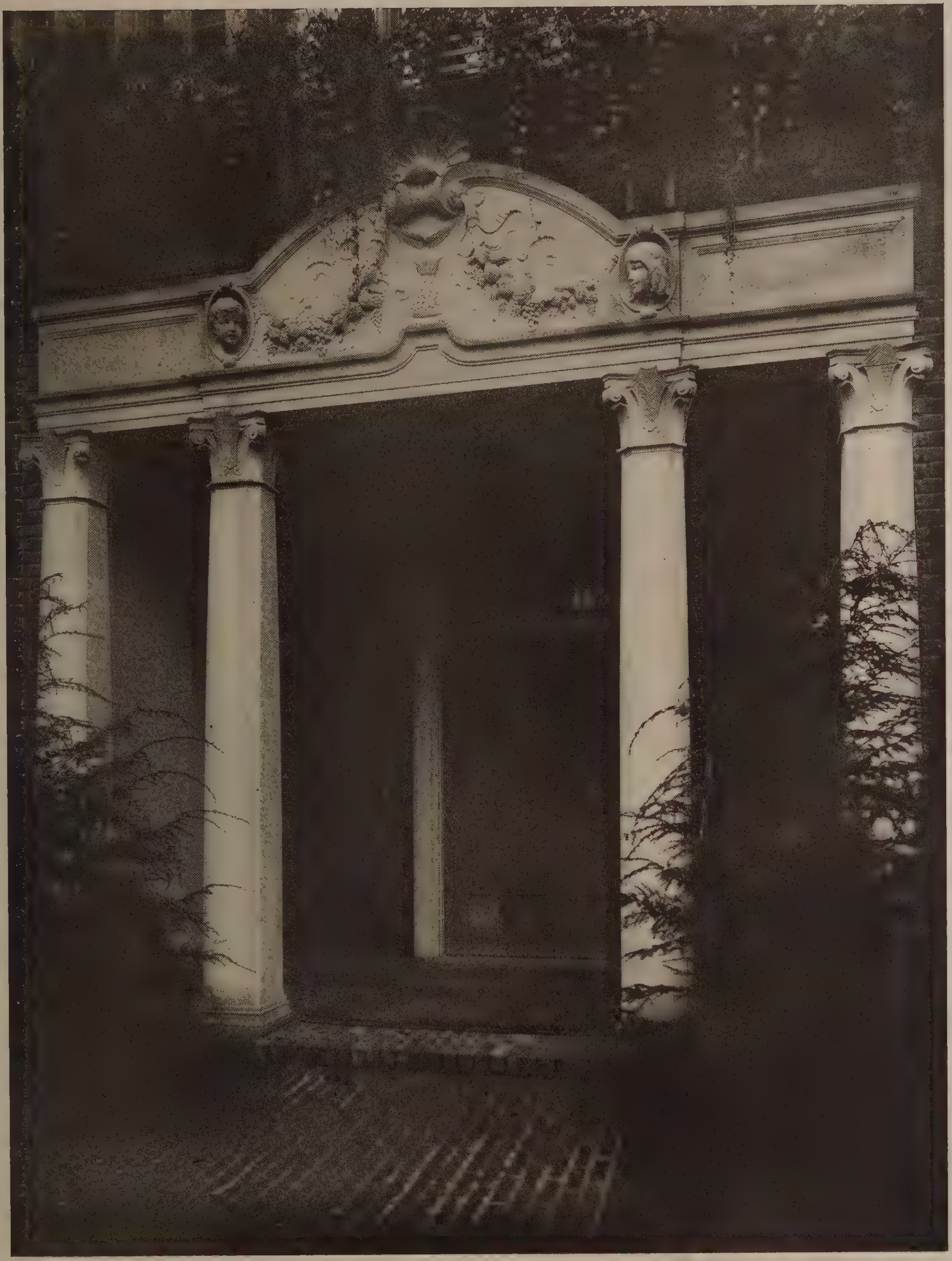
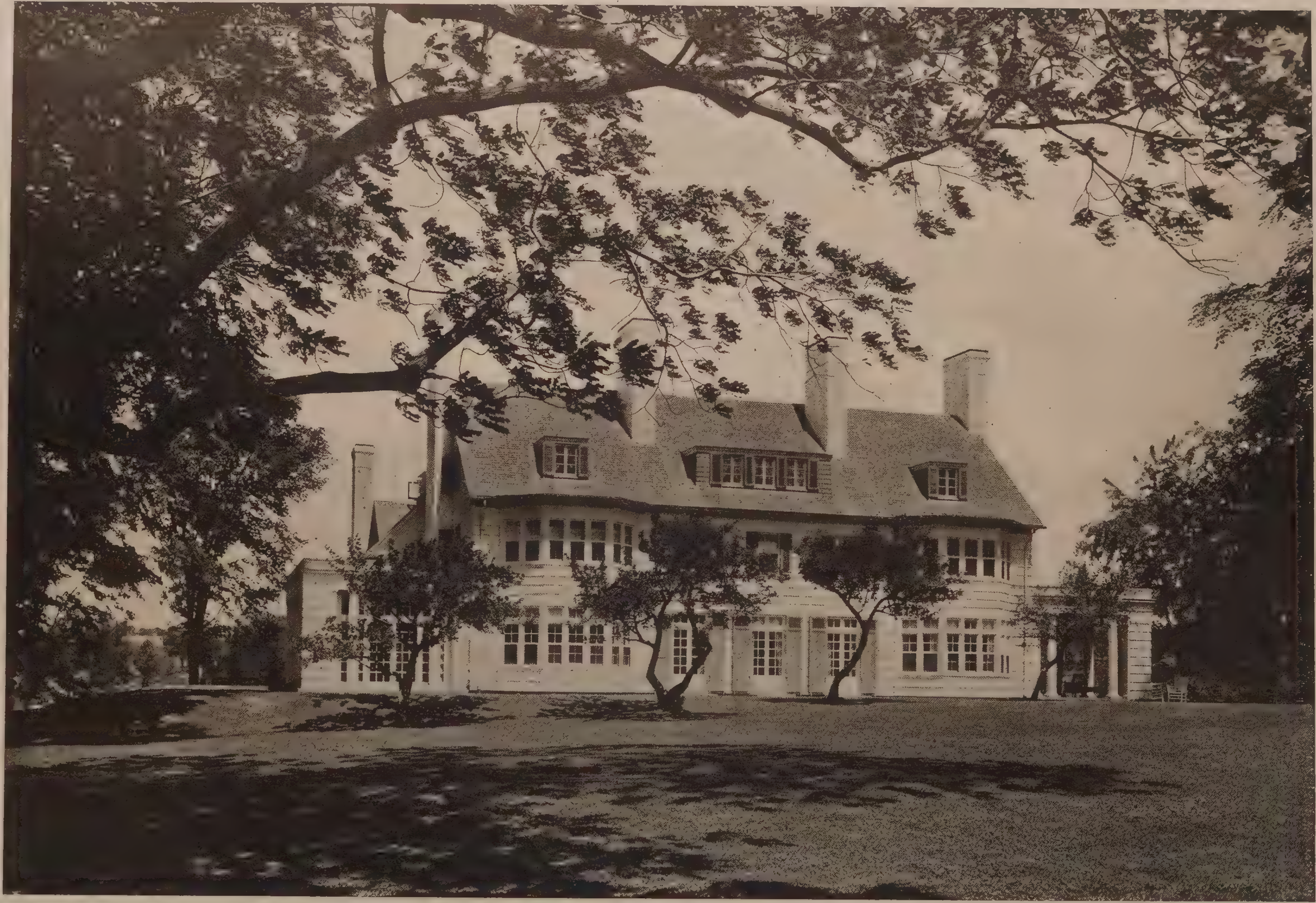


DETAIL, HOLIDAY FARM, ASTOR MEMORIAL, RHINEBECK, N. Y. Designed by H. T. Lindeberg, Albro & Lindeberg, Architects.

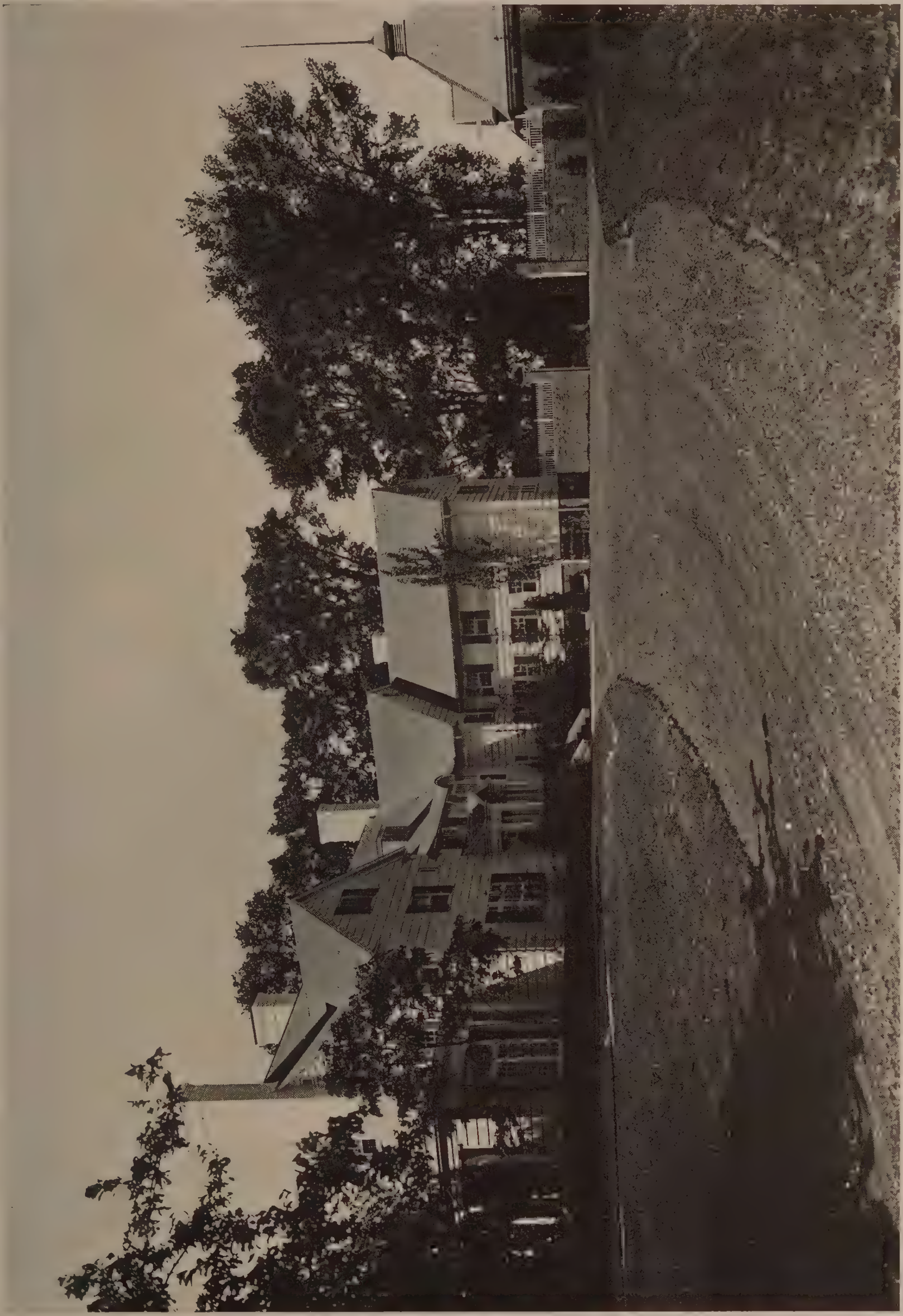


DETAIL, ENTRANCE, HOLIDAY FARM, ASTOR MEMORIAL, RHINEBECK, N. Y. Designed by H. T. Lindeberg, Albro & Lindeberg, Architects.



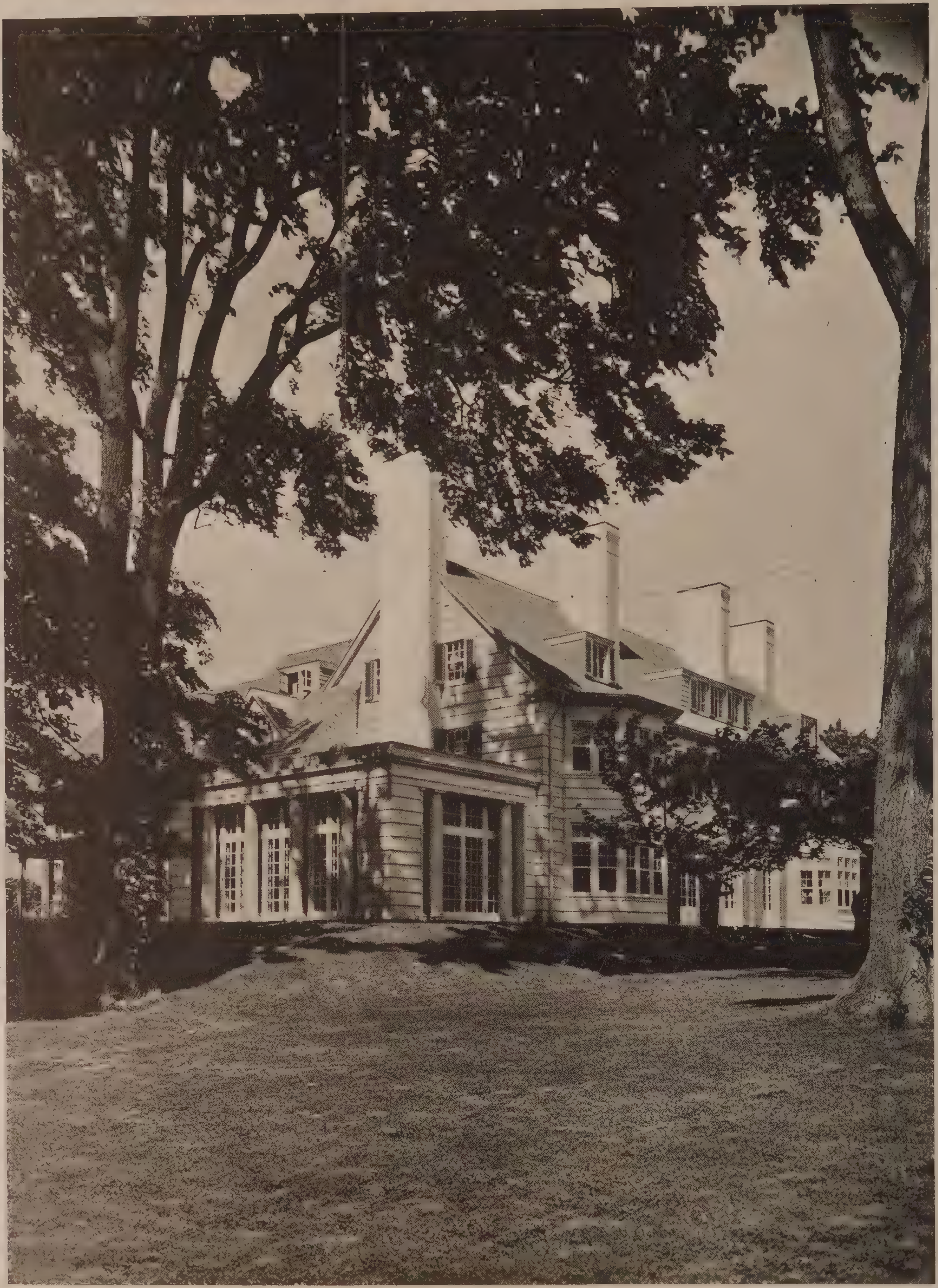
SOUTH FRONT HOUSE, PHILIP B. JENNINGS, BENNINGTON, VT.

Designed by H T. Lindeberg, Albro & Lindeberg, Architects.

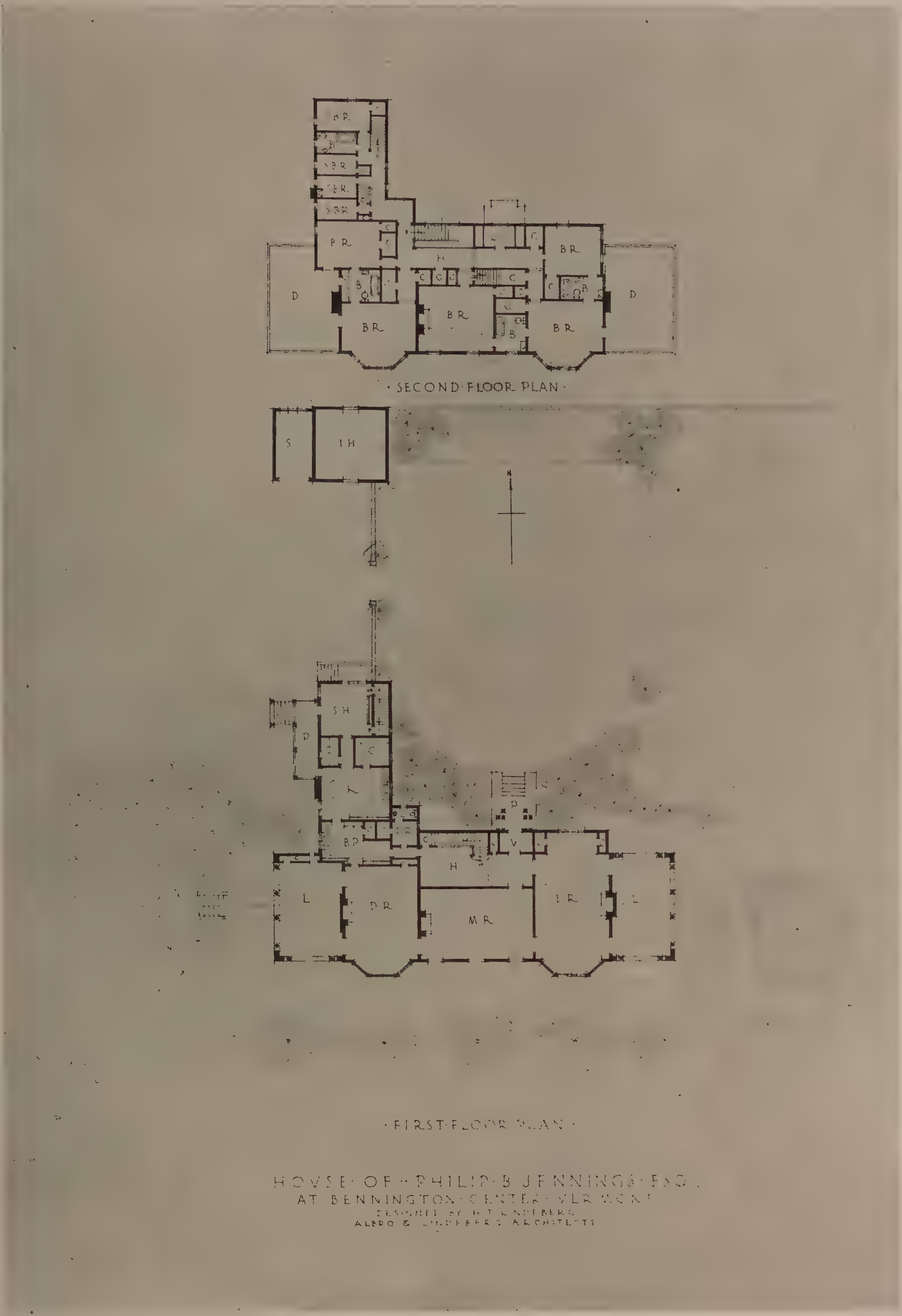


ENTRANCE FRONT, HOUSE, PHILIP B. JENNINGS, BENNINGTON, VT.

Designed by H. T. Lindeberg, Albro & Lindeberg, Architects.



HOUSE, PHILIP B. JENNINGS, BENNINGTON, VT. Designed by H. T. Lindeberg, Albro & Lindeberg, Architects.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PLANS, HOUSE, PHILIP B. JENNINGS, BENNINGTON, VT. Designed by H. T. Lindeberg, Albro & Lindeberg, Architects.

ARCHITECTVRE

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EDITORIAL

THE ARCHITECT'S PRELIMINARY ESTIMATE—THE ARCHITECTURAL EXHIBITIONS

PROBABLY one of the most fruitful sources of trouble between architects and their clients is in regard to the cost of the work and it is a commonplace that clients put very little faith in an architect's statement of what work will cost. While it cannot be believed that the architectural profession is nearly so much at fault as the general public thinks it is, there must be some fire where there is so much smoke. Of course there may be very good reasons why an architect's preliminary estimate is exceeded by the actual cost of the building, the usual one being that the client asks for the cost of the building about the first thing, before an architect has had time to work up a design, or even to discover how elaborate a building is desired.

This first estimate of the architect must necessarily be a guess, and if the building is one of a class to which he is thoroughly accustomed his guess may approximate correctness. It would probably not be very difficult for a firm which has designed a number of loft buildings to tell a client what a twelve story loft building on a fifty foot lot, with a façade about as good as others in the neighborhood, would cost, since the requirements in all loft buildings are substantially the same and the amount of area which is covered will usually be limited only by the building laws.

The man who is doing many country houses can guess with some approximation to correctness the cost of a country house containing a given number of rooms if he can gather from his client some idea of the materials of which the house is to be built and the size of the rooms which it is to contain, but when the average client comes to the architect to have his house built with the statement that he wants a "large" living room, a "fair sized" dining room and a "small" study, the architect can form no conception of what "large", "fair sized" and "small" mean to this particular man.

The making of such preliminary estimates should be done with the utmost circumspection and with all the qualifying and limiting clauses that there are; or better yet it should not be made at all until sketch plans are approved. One recent case illustrated this rule pretty well; a certain firm that had designed a number of school houses with great success was employed by the school board of a large town near New York, to design for them a twelve room school house, and before employing the architects the school board requested from them an estimate of cost if built of materials similar to those of several other schools which they had designed. Things went along nicely until the architects discovered that the board desired the type of school house which Mr. Ittner of St. Louis has made familiar, with all the rooms on one side of the corridor. In such a plan the relation between the perimeter of the building and the number of rooms is far in excess of the usual plan where the corridor runs through the center. The architects then informed the school board that such a building would be more expensive than the estimate which they had previously given; the question as to whether their employment is to be continued is now being worked out between their lawyers and the lawyers of the school board.

Now the cases above mentioned are those in which the architect can really guess with some approach to accuracy, but very many architects are perfectly willing to guess at costs when they know that they are making only a guess, and know also that the client is accepting it as an estimate. There are so many classes of buildings in which no one can foretell with any accuracy what the client is going to want, that any estimate before sketches are made and before at least a memorandum specification is prepared, must necessarily be wild, and an architect should not venture a preliminary estimate on this sort of work without safeguarding himself in writing. Cases where these guesses are on the safe side are unusual, and the consequence is that the unreliability of the architect's estimate has become more or less of a standing joke, and nine clients out of ten expect to pay more than they say they are willing to.

Of course it is natural that an architect should make his preliminary estimate as low as possible; in the first place he wants to please his client, and next, the job is more apt to go ahead if the client thinks he can do it cheaply, and the architect always hopes by some miraculous intervention of Providence, that the client will not want unusual and extravagant features; but clients always do, and the probability of their wanting some thing which is out of the ordinary, and which is expensive, should be allowed for in advance. The average client who comes into the architect's office, comes in with a kind of contempt for the architect's ability as a business man, when as a matter of fact it is his own ability which is at fault. The question as to how much a building is going to cost before the sketches are made is no more business-like than the proverbial one of how long is a piece of string, and a business man, astute enough in the ordinary relations of life, goes about the construction of his place of business or residence in a manner which would disgrace an intelligent child; or at least this is the way the architect feels about it. Many clients, too, believe that the architect by the mere act of willing can make a building cost as much or as little as he pleases; there is no doubt but that an able architect can by clever planning and arrangement secure maximum accommodations in a given space, or by ingenious arrangements of materials secure a handsome building from materials of moderate cost. But when the client presumes to dictate (as he very usually does), the style, the materials, and even to interfere in questions of plan, the architect's power to govern the cost of the building is largely taken from him, and for this reason preliminary estimates should be made with the utmost reserve, so that eventually the profession may come to be regarded with more respect and less suspicion.

A certain old specification writer, when questioned as to why he wrote with such completeness details of construction which appeared perfectly obvious, said that it was necessary to "proceed on the principle that all contractors were fools," although every one knows that the fool contractor is probably scarcer than the fool architect. The architect should proceed with his client in much the same way. Probably few clients are completely in this category, as otherwise they would not go to architects for their plans, but the more minutely the architect prescribes to the client the conditions which govern cost and his responsibility for it, the less apt the client and architect are to part, each with the conviction that the other is an insensate ass.

There is perhaps a natural tendency among architects to gloss over the business aspect of their relations with clients, and as far as the business end is concerned to go about the getting of a job in much the same way that a physician treats his patient, feeling that he loses in professional dignity if he goes prematurely or exhaustively into questions of the cost of the building, fee, etc. As a matter of fact the average client is very glad to know so far as he can what he is going to have to pay his architect, and the fact that the architect clearly states his inability to determine the precise cost, in advance of his knowledge of what the building is to be, does not abate the client's respect for his ability; it will on the contrary generally be increased, providing that the client can be made to understand the reasons for the architec's refusal to name exact figures.

The general attitude of the client to the architect is always a curious one: he regards the architect as a sort of combination of prophet, artist and baby, but is likely to conceal his feeling in the first two respects, permitting the architect to fully perceive his sentiments about the third, however, and there is probably no single way in which the attitude of the public can be improved unless by great care in the making of preliminary estimates.

THE season is already approaching when the annual architectural exhibitions will be given in most of the principal cities in the United States, and in the various cities architects are now engaged in preparing work for exhibition, or in gathering together and assembling into agreeable form the pictorial representations of their work. The value of architectural exhibitions is unquestionably great, not alone because of the direct improvement in public taste which results in the minds of prospective builders from attendance but also because of the manner in which they react upon the architectural profession itself. They unquestionably are a very great stimulus to the younger men, who see gathered together, perhaps in one room, the best work of the preceding year, and can find a standard, not only of design, but also of presentation to which they may aspire. But the man who is most powerfully and most favorably affected by the annual exhibition is the exhibitor whose work does not quite come up either in design or presentation to the best in the show, and it is this man and through him his clients, who probably gain most among all those who see the exhibition. Let us assume that such a man's work is good, as it must be to be exhibited at all. There is no one who cannot do a little better than his previous best, and it is just the stimulus of comparison that these exhibitors afford which enables the intelligent and interested architect to learn where and how he may progress.

A man's work often looks perfect to him until it is placed side by side with the work of others who have had to face a like problem, and it is then alone that he is enabled to perceive his faults. On the other hand the exhibition will often be a comfort to the man who feels he has done something perhaps not quite worthy, and finds that other men facing the same conditions have not succeeded so well as he.

Exhibitions, at least to a large extent, have lost the quality of news that they once had, because of the carefulness with which the architectural magazines cover the field. As soon as it is published the best current work is made familiar through publications, and exhibitions have become rather reviews of the year's work than news to the profession, but as much of the work is shown in drawing, and no architectural magazine has pages big enough to reproduce a drawing at its full size, novel and happy qualities will in many cases be found. This is especially true of color drawings, since even the most careful reproduction with orthochromatic plates will not enable one to appreciate color sketches justly and methods of rendering will hardly be discernable in reproduction.

In the question of presentation the exhibitions are especially helpful to the architects, whether the work presented be shown in drawing or in photograph, and the money spent in preparing show drawings or frames of photographs is often rewarded by the increased interest displayed in such drawings by prospective clients. The question of the type of drawing suitable for exhibition has long been a vexed question; the annual exhibitions appear to be becoming more and more exhibitions of photographs, with a few superb renderings, and whether more technical drawings would be of advantage to the exhibition is a question which we feel incompetent to answer, although some general answer is necessary. It is certain that beautifully drawn details, even if they are working drawings, would be of interest to the architectural profession, and it is equally certain that photographs or perspective drawings mean much more to the outsider. As the exhibitions are not given exclusively for either the architects and draughtsmen or for the non-technical public, it must ever remain a nice question as to just how far a hanging committee is justified in the selection of a preponderance of photographs and color drawings, and this is probably a question to which no conclusive answer can be given. The hanging committee will annually have to face the problem anew in each of the cities where the exhibitions are given, governing their selection and adjusting their policy after examination of the material offered for consideration.

There is one point, however, on which the public and the architects will agree, and that is in their desire to see more decorative painting and architectural sculpture included in the exhibitions; by this we do not mean more painting and sculpture simply, but more work in each of these arts which is directly and only applicable to architecture. It has been the custom at several of the annual exhibitions to include such paintings and sculptures as could exhibit even a very faint kinship to architecture, if the exhibits were in themselves agreeable, and while this policy may perhaps attract a certain proportion of the general public, it does not assist in educating them in the value of painting and sculpture as adjuncts to architecture, aside from their value *per se;* and as perhaps the most interesting sculpture which we have had in America during the past ten years has been that which was strictly architectural, it would seem that the inclusion of work which could not be so classed is unnecessary and an injustice to the sculptors whose executed work is in relief rather than in the round, or if in the round has been designed to carry out certain forms. While it can hardly be said of painting that the best work we have has been that serving as a decoration and foil to architecture, certainly some of the finest work in the United States has been made for this purpose, and men whose names rank very high as portrait painters have been able to show equal ability in purely decorative work; as for example Sargent in the Boston Library, and Alexander in the Congressional Library at Washington.

Besides this the painters and sculptors have their own shows in every city of importance, into which an architectural drawing would hardly be admitted, and by means of which the painters and sculptors can show their general work, reserving their strictly architectural subjects for the architectural exhibitions. It is, of course, difficult to obtain (or to hang when they are obtained) enormous decorative canvases, or large groups of sculpture; these things as soon as exhibited are put in place, so that they often cannot be gotten at at all and must be shown by preliminary sketches and by photographs. After all this is not an unsatisfactory way; some of the freshest painting we have is that which was done most rapidly, and the sketches which show the technique and method of development of decorative ideas are as instructive as completed work.

Were completed work only to be shown, architects would have to import their houses bodily into the exhibitions instead of using photographs or sketches, and if the architects do not feel that their work suffers by being thus exhibited, it would seem that the painters and sculptors likewise should be content with exhibits of small size, tentative studies, photographs and the like.

This ought to be a good year for exhibitions; architects have time enough to properly prepare work, and the amount of good work which has been done in the last two years has been exceptional. So we may confidently look forward to a series of exhibitions as fine as any which have been held in this country.

ARCHITECTURE is not one art, it is many. Architecture is not an art only, it is also a science and an industry. For the fulfillment of all this, many and different qualities are required. There are diversities of gifts but one spirit. All the gifts must be exercised with the one spirit, the single aim toward the perfection of the final result as an expression of the Fine Arts, as an example of sound and perfect construction, as a practical solution of an economic problem.

R. Clipston Sturgis, Pres't. A. I. A.

VII. ENGINEERING FOR ARCHITECTS

BY DeWITT CLINTON POND

Mr. Pond has charge of the practical course in structural design at Columbia University. He is extremely successful in instructing men who have had little knowledge of mathematics, and these articles have been writtén with that in view.

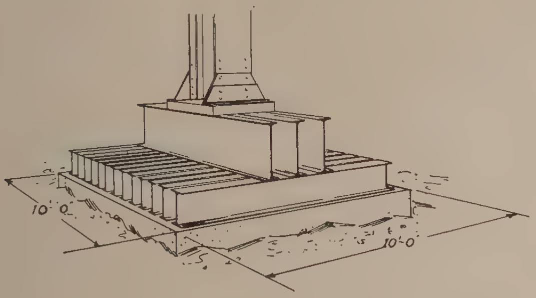
WHEN column loads have to be distributed over soil the methods employed in figuring the footings are the same as in Article VI, but, as soil will only withstand a compressive force of four tons per square foot, the results differ from those of the preceding article. In the case where there was a bearing on rock, the failure of the grillage might have occurred in the concrete under the steel, the concrete being weaker than the rock. For this reason it was necessary to reinforce the concrete and to assume that only the concrete in direct contact with the steel had any bearing value. These precautions will not be necessary when the bearing is on soil as the earth will settle before the concrete will fail. In Article VI, the first consideration was the size of the concrete slab. In the present case it is the area of the soil over which the concrete slab is spread that must be determined first.

Given a column load of 400 tons, and the safe bearing value of soil as 4 tons per square foot, the area over which the load is to be distributed is $400\div4=100$ square feet. If the footing is made square the outside dimensions will be 10 feet by 10 feet. (Fig. 39.)

Allowing a projection of concrete of 4 inches on all sides the length of the beams in both layers will be 10 feet, minus 8 inches, or 9 feet 4 inches. (9.33 feet.)

The steel slab under the column will be made 3 feet square, and, using the formula for bending given in Article VI, the maximum bending moment for the beams in the upper layer will be $M=\frac{1}{8}\times400\times(1-a)$ or $50\times6.33=316$ foot-tons. The section modulus is $316\times1\frac{1}{2}=474$. It is possible to place three beams under the slab and the sections modulus for each beam will be $474\div3=158$. Three 24-inch, 80-pound I-beams will be sufficiently strong to withstand the tendency to fail by bending.

The beams project on each side beyond the slab approximately one third of their total length and the maximum shear will be $1/3\times400=133$ tons. The web of a 24-inch, 80-pound I-beam is ½ inch thick, and the *area* of the web is $24\times\frac{1}{2}=12$ square inches. Three beams will have a total web area of $12\times3=36$ square inches. As the total shear is 133 tons, the shear per square inch of web will be $133\div36=3.66$ tons. The Building Department allows a shear of 4.5 tons on steel and the beams are safe as far as failure by shearing is concerned.



FIGVRE 39

The only other method of failure to be considered, for the beams on the top tier, is the *crushing* of the *web*. The slab extends over a length of three feet and the webs are one-half an inch thick so the area of the web under the plate is $36\times\frac{1}{2}\times3=54$ square inches. The load is 400 tons, and the compression per square inch is $400\div54=7.4$ tons which is safe. The upper layer of beams is strong enough in every particular.

In the lower layer the beams should be placed so that there will be comparatively little space between the adjacent flanges. If twelve beams are used, spaced $9\frac{5}{8}$ inches on centers, they will practically cover the concrete. The total section modulus for all of these beams will be the same as for those in the upper layer as W and (1—a) remains the same. This should be checked. In order to find I/c for a single beam, simply divide 474 by 12 and the result—39.5—will be the section modulus. The lower tier of beams will consist of 12 12-inch, 40-pound I-beams, 9 feet, 4 inches long and spaced $9\frac{5}{8}$ inches on centers. By the methods already employed these beams should be checked for shearing and crushing of the web. They will be found to be safe.

Fig. 40 shows a condition in which the corner column is so placed that a square footing cannot be used as two sides will be outside the building lines. As this is not allowed in most cities, a type of foundation must be employed somewhat different from any we have considered so far.

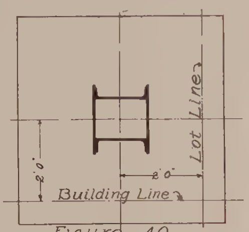


Figure 40

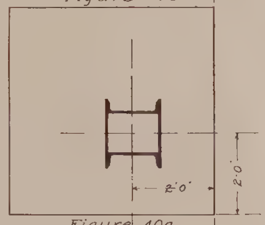
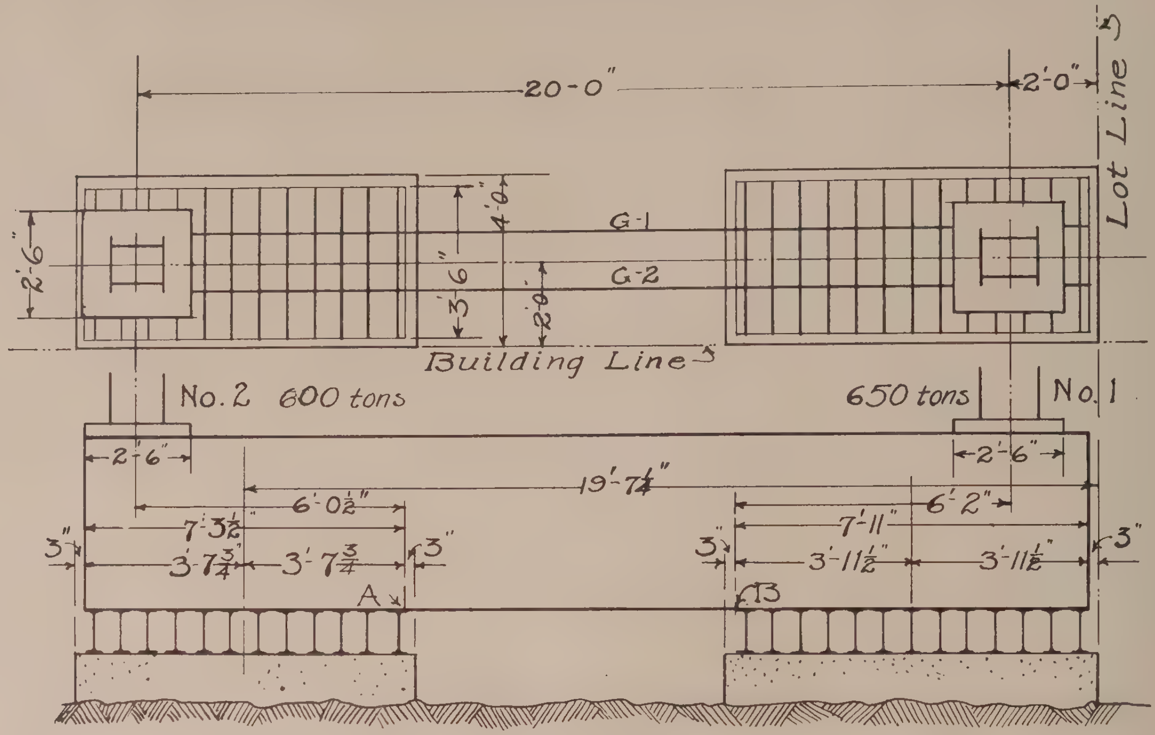


Figure 40a

If the footing were spread, as shown in Fig. 40a, so as to throw the center of the column off the center of the concrete base the tendency would be to make the footing settle unevenly. This tendency toward uneven settlement can be illustrated by considering a row boat in which the only occupant is located in the bow. The bow will sink slightly in the water and the stern will rise. If another person should be placed in the stern the two occupants would counterbalance each other and the boat would set evenly. In like manner, if the footing of the corner column were extended far enough to the left to allow the next outside column to rest upon it, the second column would act as a counter-balance for the corner one, and, provided the dimensions of the footing were properly proportioned, there would be no more tendency to settle in one direction than in another.

Fig. 41 shows a diagramatic plan and elevation of this condition. Column No. 1 is the corner column, having a load of 650 tons, and which is located 2 feet back of the building lines. Column No. 2 carries a load of 600 tons and is on line with the corner column. The distance between No. 1 and No. 2 is 20 feet. Under the two columns two girders, G1 and G2, are placed and I-beams are distributed



FIGVRE 41

under the girders to carry the loads to the concrete footings. These footings rest upon rock.

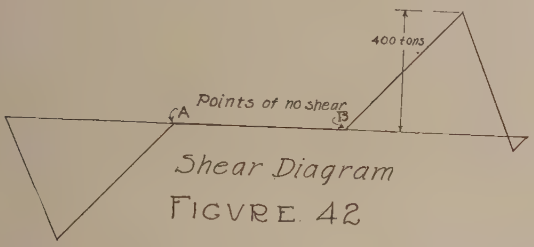
If the architect understands clearly the method of solving the conditions referred to in Article VI, the only new problem to be solved is the position of the I-beams and concrete footings. First, it is necessary to assume the size of the I-beams and determine their length and number. As 12 inches, 31½-pound I-beams have proved satisfactory for most conditions imposed upon the lower layer of grillage beams, it will be *assumed* that they will be satisfactory in this case. The length is governed by the dimensions of the concrete. As the centre of the footing is 2 feet back of the building line, the width of the footing can only be twice this or 4 feet. Allowing an overhang of three inches of concrete beyond the ends of the beams, the beams themselves can only be 3 feet, 6 inches long. The flanges of 12 inches, 31½-pound I-beams are 5 inches wide, and, as the beams are 42 inches long, there will be 42×5=210 square inches of flange bearing on the concrete for each beam. In Article VI the reinforced concrete in direct contact with the steel was considered as having a bearing power of one-quarter of a ton (500 pounds) per square inch. The concrete under each beam will support 210÷4=52.25 tons.

Column No. 1 has a load of 650 tons. The number of beams under this column will be determined by dividing the load by 52.25. 650÷52.25=13 approximately. There will be 13 beams under the corner column. In like manner there will be 12 beams under column No. 2. If the beams are placed 7½ inches on centres the set under No. 1 will spread over an area of concrete of (12×7½)+5=95 inches. The 5-inches added to 90 is the width of a single flange. Ninety-five inches equal 7 feet, 11 inches. (Fig. 41.) The I-beams under No. 2 will cover 7 feet 3½ inches.

So far the considerations involved have been exactly the same as those mentioned in Article VI. The next step, however, is a new one and involves the consideration of moments. The architect should thoroughly understand what is meant by the term *moment* and in case there is any doubt on the subject he should look over Article I, which appeared in the July number of ARCHITECTURE, again. A centre of moments can be taken at any point, and, for conditions of equilibrium, the sum of all moments around this centre must equal zero. In other words, the upward moments must equal the downward moments around this centre.

For the given conditions, the centre of moments will be taken at the building line. Column No. 1 has a load of 650 tons, and the distance from its centre to the building line is 2 feet, so the moment around the assumed centre is 650×2=1,300 foot tons. The second column has a moment of 600×22=13,200 foot-tons. The total *downward* moment is 1,300+13,200=14,500 foot-tons. To counteract this there must be an *upward* moment equal to it and the two sets of I-beams may be considered as exerting *upward* forces which will cause the upward moments. Each force will be equal to that brought down by the column under which each set of I-beams is placed, and the forces will be considered as acting at their respective centres of gravity.

The beams under column No. 1 will be placed as near the building line as possible, but, as there should be a projection of 3 inches of concrete beyond the steel, the centre of the set will be (7'-11"÷2)+3=4'-2½" from the building line. The upward moment caused by the footing will be 650×4.20=2735 foot-tons. Subtracting this from 14,500 foot-tons leaves 11,764 foot-tons to be taken up by the second set of beams. As this moment must equal a force multiplied by a distance, and the force (600 tons) is known, the question is to determine the distance. Let X equal this distance. Then $600 \times X = 11,764$ or $X = 11,764 \div 600 = 19.60$. Fig. 43 shows a diagram representing these conditions—the two columns acting downward and the two footings acting upward with their respective lever arms.



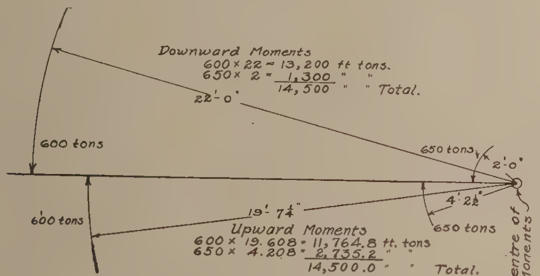
FIGVRE 42

We now have the size, number and location of the I-beams in the trial footing. From knowledge which has already been acquired it is possible to lay-out the beams as shown in Fig. 41.

The next step is the determination of the members in the girders. The two slabs, under the columns, are each 2 feet 6 inches long. The sets of I-beams will be assumed to act as uniform loads extending over 7 feet 11 inches and 7 feet 5 inches respectively. The shear diagram is shown in Fig. 42, and, as all the loads are uniformly distributed, the shear is represented as varying as a series of sloping lines. In Article III the statement was made that a beam will fail by bending at the point where the shear is zero. From the diagrams it can be seen that the shear is zero at any point between A and B. To find the bending moment at A we have two forces to account for—the 600-ton load of the column acting downward and the 600-ton load of the footing acting upward. Both loads act through their centre of gravity. The moment of the column load is 600 tons $\times$ 6.04 feet $=$ 3624 foot-tons, and the moment of the footing is $600 \times 3.65 = 2190$ foot-tons. The difference is 1434 foot-tons. In like manner, the moment around B is $650 \times (6'\text{-}2'' - 3'\text{-}11\tfrac{1}{2}'') = 650 \times 2.208 = 1435$ foot-tons. It will be noticed that both moments are approximately equal and also that the same results may be obtained by multiplying the column load by the distance from the centre of the footing; thus, 600 tons $\times$ 2.39 $=$ 1434 foot-tons.

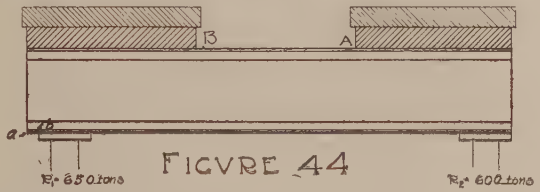
From the shear diagrams the maximum shear can be obtained. This is found at the point C—the edge of the slab under column No. 1—and equals approximately 400 tons.

Two riveted girders, made of plates and angles, can be designed according to the principles mentioned in Article IV. The shear for two girders is 400 tons and for one is 200 tons. To use the formula for the depth of the girder given in the former article will give an excessive depth as the shear is large in proportion to the maximum bending moment. The most satisfactory method will be to assume the depth as some convenient figure—4 feet— and design the girder for this depth.



FIGVRE 43

Another method is to select the proper riveted girder from those given in the Carnegie "Pocket Companion." On pages from 235 to 250 are given lists of plate girders the sizes of which are determined by the section modulus of each girder. In the present case the maximum bending moment for two girders is 1,435 foot-tons and the section modulus is $1,435 \times 1\tfrac{1}{2} = 2,152$. For one girder the section modulus is one-half this or 1,076. On page 249 of the Pocket Companion, a girder will be found having an I/c of 1,083 which is the nearest to the figure given above. These girders will be made of a 48-inch by ½-inch web plate, four $6 \times 6 \times \tfrac{1}{2}$-inch flange angles, and two $14 \times \tfrac{5}{8}$-inch flange plates. In using such a girder it must be remembered that the safe working stress used was a basis for its design is taken as 8 tons. The New York Building Code requires that for riveted steel this stress should be 7.5 tons. The girder should also be stiffened by stiffener angles directly under the columns and at the points of maximum shear.



FIGVRE 44

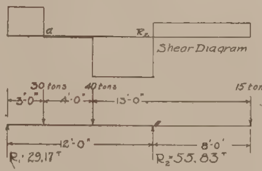
The method of designing such stiffeners would be the same as used in Article IV.

So far the I-beams in the lower layer have not been checked for bending, but if (l—a) is 1 foot and the load on twelve I-beams is 650 tons it will be found that they are safe. This is also true regarding failure by shearing and crushing.

Referring again to the Pocket Companion, on pages 224-25-26-27 and 28, it will be found that the problem of grillage beam design is dealt with. In these cases the footings are on soil and for a short and comprehensive treatment of the subject it is probably the best published.

For reasons, unknown to an engineer, architects often refer to such girders as designed in this article as cantilever girders. As a matter of fact only a small portion acts as a cantilever so the bending moments and shear are determined in exactly the same manner as if the girders were simple beams. Imagine Fig. 41 turned upside down as shown in Fig. 44. Now the column loads act upward and the uniform loads of the footings act downward. Only the portion *ab* overhangs the support and acts as a cantilever. Because *ab* is so small, the bending set up in the girders, due to this projection is not enough to influence the actual design of the girders as the tendency toward bending at the points A and B is so much greater.

As an actual example of a simple cantilever beam note the condition shown in Fig. 45. Here we have a load of 15 tons located 8 feet from R_2 and the portion of the beam projecting to the right of R_2 acts as a cantilever.



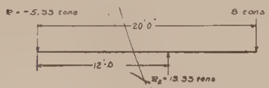
FIGVRE 45

The design of such a beam is simple provided the architect does not set difficulties in his own path. To find the reactions the same method is employed as in the case of a simple beam. Taking R_1 as the centre determine the downward moments around this centre.

30 tons× 3 feet= 90 foot-tons
40 tons× 7 feet=280 foot-tons
15 tons×20 feet=300 foot-tons
Totals 85 tons 670 foot-tons

670 foot-tons÷12 feet=55.83 tons=R_2.
85 tons—55.83 tons=29.17 tons=R_1.

The shear diagram is shown in Fig. 45 and from this it is apparent that there are *two points* of no shear. In other words there are two points at which the beam might fail by bending. It will be necessary to find the bending moment at each point to determine which is the greater. The one at *a* is 29.17×3=87.51 foot-tons, and the one at R_2 is 15×8=120 foot-tons. It is obvious that, if the beam should fail by bending, this failure would occur at R_2. As the bending moment at this point is 120 foot-tons the section modulus is found by multiplying 120 by 1½, which gives an I/c of 180. A 24-inch, 85-pound, I-beam will be found to have this section modulus.



FIGVRE 46

For the conditions shown in Fig. 46 a *downward* or *negative* reaction will occur at R_1. Taking R_1 as a centre of moments and finding R_2; 8 tons×20 feet=160 foot-tons. One hundred and sixty foot-tons÷12 feet=13.33 tons=R_2. To find R_1 subtract R_2 from 8 tons, or, 8 tons—13.33 tons=5.33 tons=R_1. The minus sign before 5.33 indicates that R_1 must act in the opposite direction from R_2.

BOOK REVIEWS.

"Colonial Mansions of Maryland and Delaware." By John Martin Hammond. With 65 illustrations. Large octavo, handsomely bound. $5.00 net, in a box. J. B. Lippincott Company, Publishers, Philadelphia.

We welcome a new volume on the Colonial Mansions of Maryland and Delaware from the press of the J. B. Lippincott Company. This is the fourth of a brilliant series upon the Historic Colonial Houses of the Eastern United States, specifically of New Jersey, Virginia, and of the vicinity of Philadelphia. These three books were, as is this one, printed in a limited edition which was immediately sold out and now they are selling at a premium among book collectors. We do not doubt but that Mr. Hammond's book will have the same history.

It is no exaggeration to say that the most characteristic and precious art treasures that we of America possess are the old colonial homes that represent to us the South of the eighteenth century, "of the olden time." In viewing their graceful lines, their perfect serenity, we feel that they are symbolic of all that fullness of life and gracious hospitality for which their owners have been and are so honored. Mr. Hammond has paid special attention to these former owners. He has made careful and fascinating studies into the family records of the owners of olden days, and many an interesting anecdote of the ancestors of the present generation is revealed. To those families or individuals who are interested in this branch of our Southern history Mr. Hammond will make a special appeal. The author has been a collector of these beautiful houses. He does not store them within a gallery as does the collector of pictures or antique furniture, but within his mind he stores their beauty and historical significance. Tramping, buggy-riding and boating he has followed his hobby up and down the "Eastern-Shore" and into and about Delaware. His elaborate camera was always with him so the results from an illustrative point of view are superb. There are sixty-five photographs which seem literally to breathe the enticing atmosphere of Plantation and Manor House.

The book will make a wide appeal. Those who love architecture for itself alone, those who are in search of true models for future building, and those who like to dream of life among the gay belles and cavaliers of other days will find in this work a thing of beauty, a guide, and a delightful romance.

Early American Churches. Aymar Embury II. 1914. Doubleday, Page & Co., New York. Cloth, $2.80 net.

The literature of early American architecture is notably extended by Mr. Embury's book on early American churches, which includes illustrations, as is stated in the preface, of practically all the remaining churches of good Colonial design and of historic interest, except where the resemblances between several of them are so close that illustrations of all of these would become mere repetition. Of late years many of our architects have returned to the Colonial buildings for our precedents, even for churches, and to have them thus collected in a single volume will undoubtedly prove a great convenience to the man who has work of this sort to do.

The reason for the inclusion of some of the churches is not always clear, but anyone will find them a body of excellently designed structures as useful in many respects for commercial and domestic design as for ecclesiastical. The author has apparently been at some pains to cover the territory very fully, and has unearthed a number of buildings of artistic merit which have hitherto been unfamiliar, as well as including such well known examples as St. Michael's at Charleston, St. Paul's in New York, and the Park Street Church in Boston. The text is written rather for the antiquarian than for the architect, although there are some things set forth about the construction of the early American buildings and the position which their designers held in the community which will be of interest to every practising architect. The appendix which gives a list of early American churches arranged in chronological order, including the names of their designers where these are known, should be valuable for reference.

As almost every edifice illustrated has a photograph of the interior as well as of the exterior, the relation of the design to the plan is pretty well shown, although no plans are included. It would seem that any designer who has a church to do would find this book invaluable, and to the architect who is interested in early American work, it will be worth while if only because of its value as a study of archaeology.

The book is well printed and substantially bound, with clear plates, and good type, and it is indeed a notable addition to the few and fragmentary books on the Colonial period.

The Book of Little Houses. 1914. The MacMillan Co., New York. Cloth, 50c.

In this little book will be found pictures and descriptions of houses that have been built at costs varying from $1,500 to $10,000 in different sections of the country.

All of the houses illustrated have actually been built and are not simply designs made as experiments. The authors of the articles reproduced include Elna Harwood Wharton, Charles E. White, Jr., M. A. I. A. and Mary W. Mount, all of whom have had wide experience in dealing with house-planning and building subjects.

This compilation is offered with the hope that it will be of suggestive value to prospective builders of small houses. There is no expectation that any design will be suitable for reproduction exactly as it is here shown, but it is reasonable to assume that certain features of some of them will be thought worthy of incorporation in a new design that shall reflect the owner's tastes and requirements.

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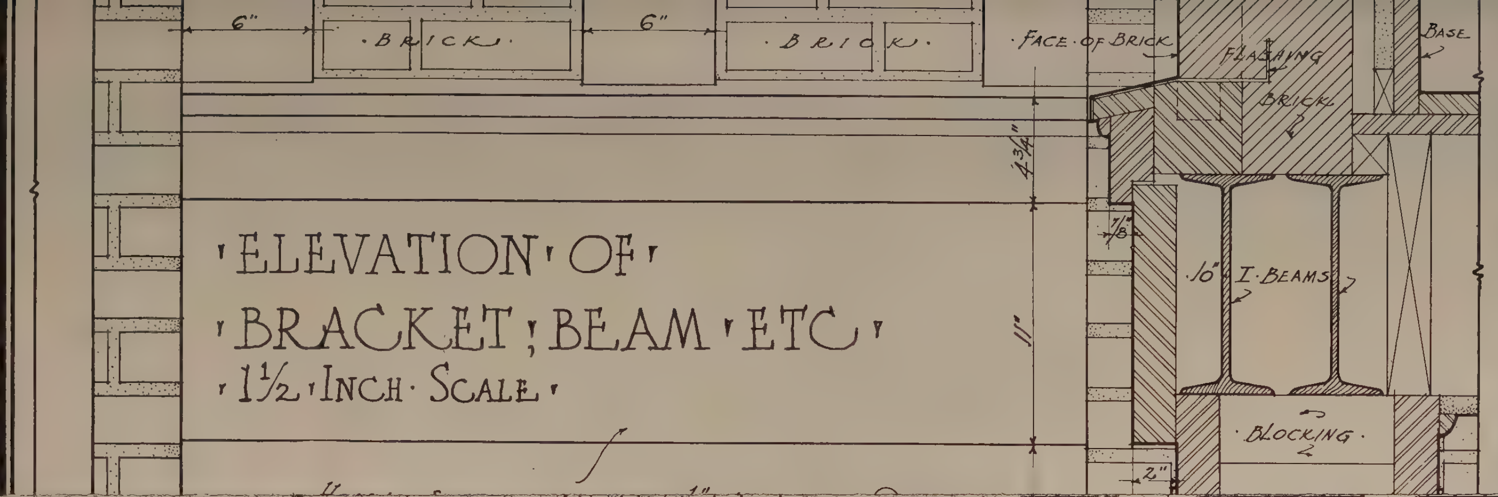

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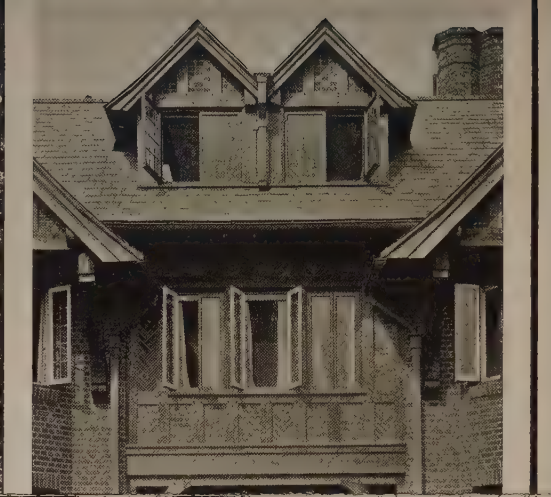

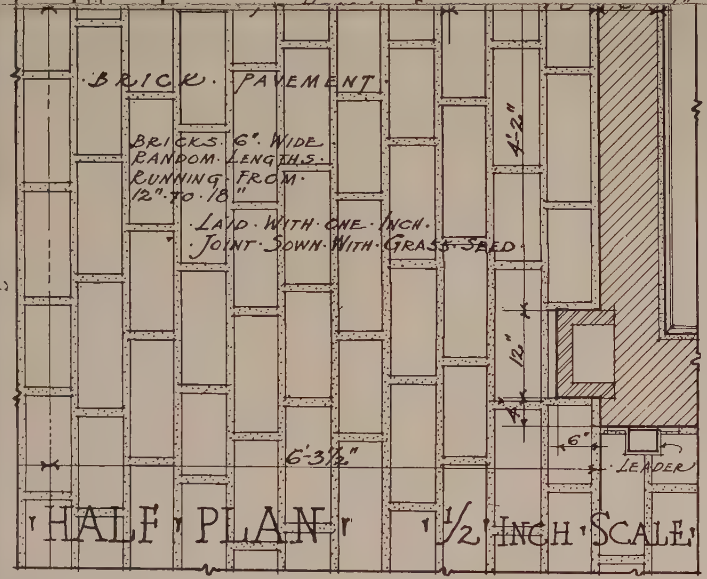

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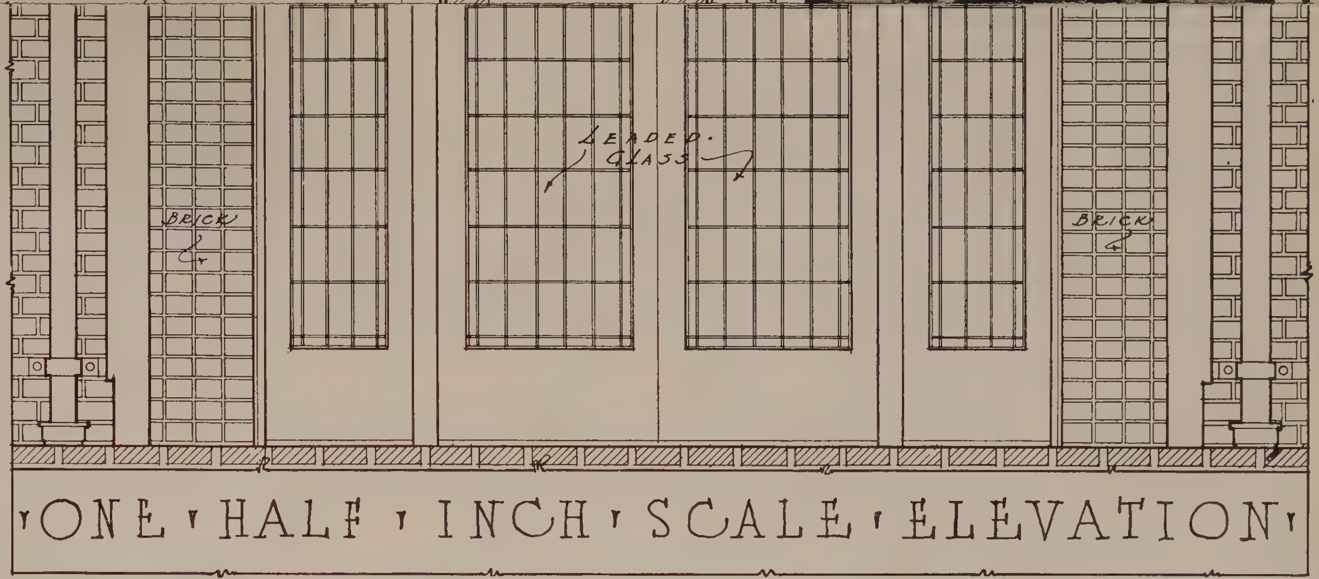

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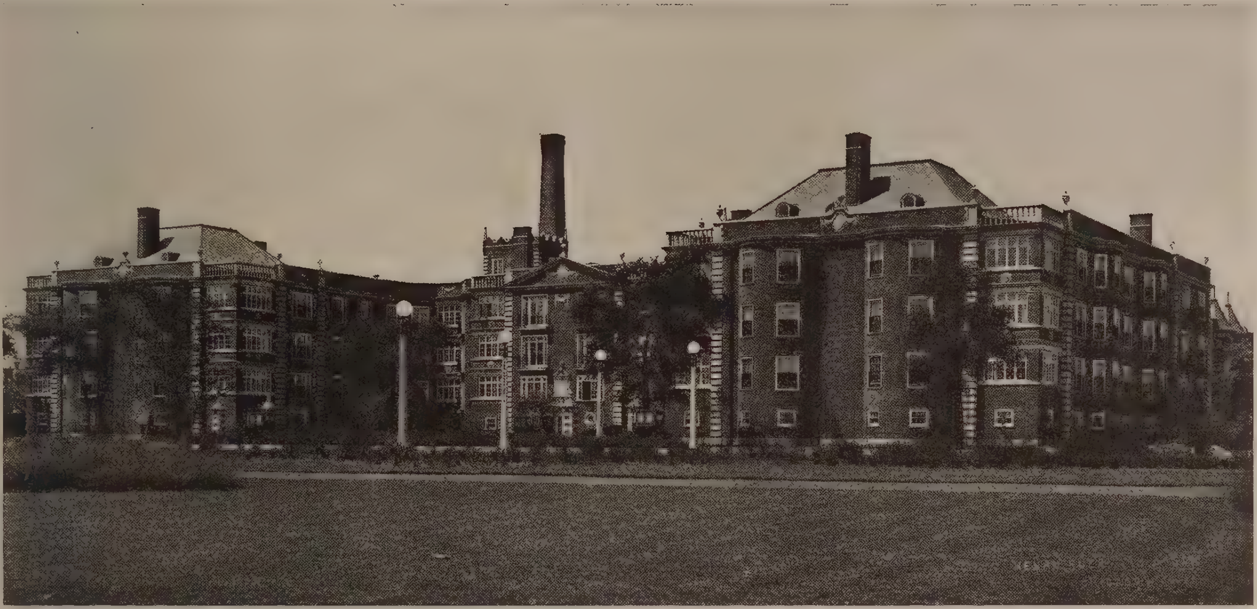


CRAIG APARTMENTS, LAKE SHORE DRIVE, CHICAGO. Schmidt, Garden & Martin, Architects.
Larger than most of the Chicago apartments and somewhat better designed, but typical.

IMPRESSIONS OF THREE CITIES

BY AYMAR EMBURY II

I. CHICAGO

IF you have always been a little more concerned with the work of your own city than with that of any other, and if you have not traveled in the United States at all, or, visiting other cities on business, have seen them only what necessarily came before your eyes, you have probably wanted to know something more about them than you could learn in such hasty visits, and have thought that in every American city there must be some work which would repay you for the time spent in examining it. Thus I felt about going to Pittsburg, Chicago and Detroit when Mr. Forbes suggested an article, telling how each of these cities appeared to a professional man practically a stranger.

I will not pretend to anything but a superficial and cursory knowledge of these three cities; to thoroughly know a city one must live in it for a long time, and while the view point of a resident of a city is probably more valuable than that of the casual stranger, this intimate knowledge is so flavored by association and foreknowledge of intended developments, that the resident of the city will be apt to describe his expectations, rather than conditions as they exist; and also much good work is apt to be overlooked because of its familiarity. Freshness of view is subsequently worth much, as we Americans have discovered from the numerous books the English have written about us, for while we are apt to complain that the views expressed are hasty, critical and unfair, we must admit that they have called our attention to things lovely or unlovely about our lives, customs and structures, which had hitherto escaped us because our perspective has been taken too close.

No man can fully comprehend all aspects either of a nation or of a great city; he can grasp only those features which are to him salient; and in a brief article like this can discuss only those things which make a personal appeal to him. I feel that this apology is due to the three cities which I visited, for even venturing to discuss them and their architecture, but I likewise believe that the personal view point of any man of training and discrimination, who comes fresh to a strange city, is worth recording.

It was a number of years since I had seen Chicago, and those of my friends with whom I discussed the city, did not lead me to believe that I should find it either beautiful or very full of interest. They described it as raw, crude,

MICHIGAN AVE., CHICAGO, LOOKING NORTH FROM THE AUDITORIUM HOTEL.

smoky, dull and uninteresting, with here and there some promise for the future; all of them I found more inclined to insist on its probable later aspect than upon its present one. Even former residents of the city spoke of Chicago in a deprecatory sort of way, suggesting that Chicago is, at present, little more than a preliminary sketch of great things to come, and I was prepared to find much that was bad and some that was intolerable.

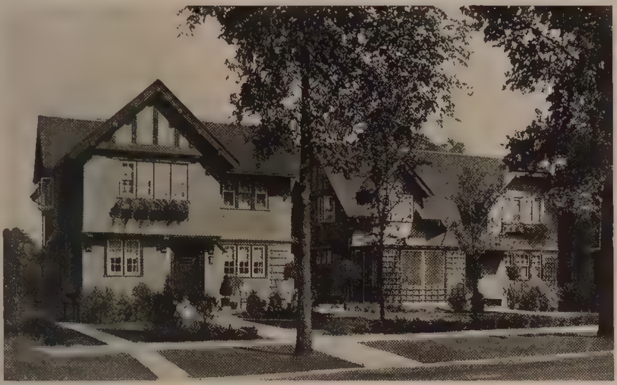
The entrance to the city by way of the Pennsylvania Railroad did little to dispell this view; the train moved slowly through miles of factories and grimy dwelling houses, passing under a pall of smoke which obscured the brightness of a warm and sunshiny day: and when the train finally stopped in a station which was low, dingy and altogether inadequate, I was neither surprised nor disappointed for I was prepared to be displeased. But when one compares this with the entrance to New York through the vast, raw newness of the Bronx, or the tin can littered Newark meadows, one realizes that Chicago is not alone among our great cities in turning its back yards to the incoming stranger. The New York that we like to think of is the financial district with its sky scrapers, the wonderful shops along Fifth Avenue, Broadway by night, or our pleasant suburbs; and the parts by which Chicago should be judged are those which correspond to these portions of New York; the business center along La Salle and Dearborn Streets, Michigan Boulevard, and the suburbs along the North Shore.

Chicago has this much advantage over New York in that the financial and commercial districts are not located in different parts of the city, and though not intermingled, are adjacent. A very large proportion of the great and substantial buildings of the city have been erected in the comparatively small area between the Chicago river and the lake front to the east and west, and between Randolph Street and Taylor Street on the north and south. Because of the small size of the district, about the entire area has been solidly covered with buildings of about the same height, and (owing to the smoke), of about the same color. Added to this is the indubitable fact that Chicago architects have been more careful in their treatments of the sides and backs of their buildings than is usually the case in other cities, and we find the Chicago business district of a much more uniform and finished appearance than any of the several business districts of New York. Streets are neither wide nor narrow, except for a few alleyways, and while the street cars are mostly overhead trolleys, the wires have been disposed so that they are almost unnoticeable. The reverse of the crudity and rawness which I had been led to expect as characteristic of Chicago, is the keynote of this part of the city. It is not so uniform as Paris, but certainly approaches nearer to a standard than London, and is much superior to New York.

Michigan Boulevard possesses quite as individual a character as Fifth Avenue, New York, and is, in its way, not inferior. Facing the lake front, the natural setting can hardly be surpassed; the paved portion of the street is extremely wide, and between the street and the lake are parking areas flanking the Illinois Central tracks, which run in a deep sunk cut. These parking areas are as yet in the experimental stage; at various points, different types of balustrades are being tried, and work is apparently progressing to make them into sunken gardens of more or less formal character. As far as can be judged at the present time the ultimate effect will be completely satisfying. At present they are more or less unfinished, but they have not been permitted to lie rough and unkempt until their final treatment should be determined, but have been leveled off and seeded down, so that they present wide green lawns that form a not inadequate foreground (as viewed from the landward side of the Boulevard) to the very lovely colors characteristic of Lake Michigan. I had determined in this article not to attempt a forecast of the future, but when one sees with how much foresight and skill Chicago has developed her parking systems, I feel safe in predicting that the lake front of Michigan Boulevard, or so-called Grant Park, will be a royal setting for Chicago's great street. The care with which the authorities are taking up the details of this improvement is evident in the electric light standards which are extremely well designed, and of two distinct types, so spaced as to present a series of little compositions.

On the landward side, Michigan Boulevard forms the boundary of the business district, and for the dozen or more blocks which border this district, the street has been solidly built up in tall buildings of substantially similar heights, and of uniformly excellent character, with occasional buildings of exceptional quality familiar to us by illustration: for example, the Blackstone Hotel, the Monroe Building, the University Club, the Michigan Boulevard

ONE OF THE BETTER CLASS OF CHICAGO FACTORY BUILDINGS.



TYPICAL SUBURBAN RESIDENCE NEAR CHICAGO
Chattan & Hammond, Architects.

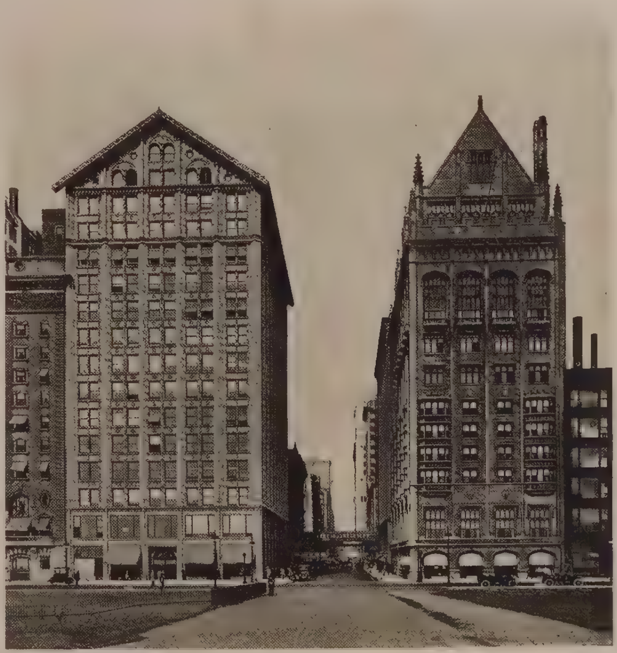
Building, the Illinois Athletic Club, Orchestra Hall, the Peoples Gas Company Building and the Congress and Auditorium Hotels. The whole frontage averages about sixteen stories, and most of the units are of considerable width, running from fifty or seventy-five feet to a full block front. One accent alone diversifies this group, a tower of excellent silhouette designed some years ago by Schmidt, Garden and Martin. This long front has one advantage over any similar group in New York or in any other city: it can be seen from a great enough distance to be appreciated as a whole, for the only building across the street is the Chicago Art Institute, a building which is more than a façade, and was very wisely designed with ends of excellent motive, superior in fact to the main front, because it is more easily seen from Grant Park or up and down the Boulevard than from the narrow street of which it forms the terminal feature.

One thing noticeable about the business district and Michigan Boulevard alike, is the prevalence of the large shop and the large building to the exclusion of the small store front, which has made so much of Fifth Avenue, New York, picturesque. Fifth Avenue is composed of small shops with occasional large buildings; in Chicago the small shop front is the exception, and has been treated with less attention than it deserved so that the attractive small shops in Chicago occupy sub-divisions of large buildings, and the small buildings are of slovenly appearance and little merit. It is just as well that this should be the case, for the peculiar personal character of this, the center of Chicago, has been obtained by the massing of large buildings, and as the small buildings are regarded as more or less temporary, this individuality is likely to be maintained.

While, collectively, the Chicago business district is probably superior to anything else in this country, individually I did not find any of the buildings of the very highest order of merit. The University Club is the most interesting of them, and is in reality much better than in photograph, but with the possible exception of this building there is no single building in the Chicago business district which can be ranked with a dozen or more of the best of the buildings in New York, as for example the Gorham Building, the University Club, or the Bankers Trust Company, to name good examples of three different classes of structures. Nor does the great building which houses Marshall Field's department store compare with Lord & Taylor's for sheer artistic interest, any more than the Blackstone Hotel can be compared with the Ritz-Carlton. To my eye at least, there is about most of the Chicago business buildings, a certain wire-drawn mechanical correctness which is æsthetically disappointing. I have always understood the Chicago theory to be that construction should be fully expressed. The Chicago men have succeeded in this to a greater extent than we have in New York, although at the expense of charm, which is almost a sine qua non of good architecture. Their buildings have been thought out, rather than felt, and in discussing this point with the Chicago architects, I found them to have such admirable and inconvertible reasons for all that they have done, that I was at loss to find means to make my point. I still feel that in denying themselves features which may be structurally redundant, the Chicago men are making a very distinct mistake. Certainly the beauty of most of the famous cathedrals depends upon the emphasis of the west front by towers and spires, yet logically there is no reason why two towers should ever be used, and very little reason for even one; a belfry ten feet square would answer every purpose, and if any part of the cathedral should be emphasized on account of the logic of the services, it would be the east end, over the altar. Yet I think that even the most hidebound enthusiast in expression of purpose would not remove the towers from the cathedrals, although the finest of the new Chicago churches, that executed jointly by Mr. Cram and Mr. Shaw, has had the tower practically eliminated.

The principal residence districts of Chicago have for the most part gathered around their parks. The Lake Shore has long been synonymous with the elaborate city mansion. It is a very beautiful parking space, and the character of the residences along it should not be judged by the example usually chosen to illustrate them, the near-German, near-baronial, near-castle of Mrs. Potter Palmer. For the most part the houses are dignified and sensible in tone, not very many of them perhaps of surpassing excellence, but most of them of a grade above mediocre, and occasionally one finds really fine things.

Fortunately for the appearance of the city they are



MONROE BUILDING. UNIVERSITY CLUB.
Holabird & Roche, Architects.
The center of the Chicago Retail Business District.

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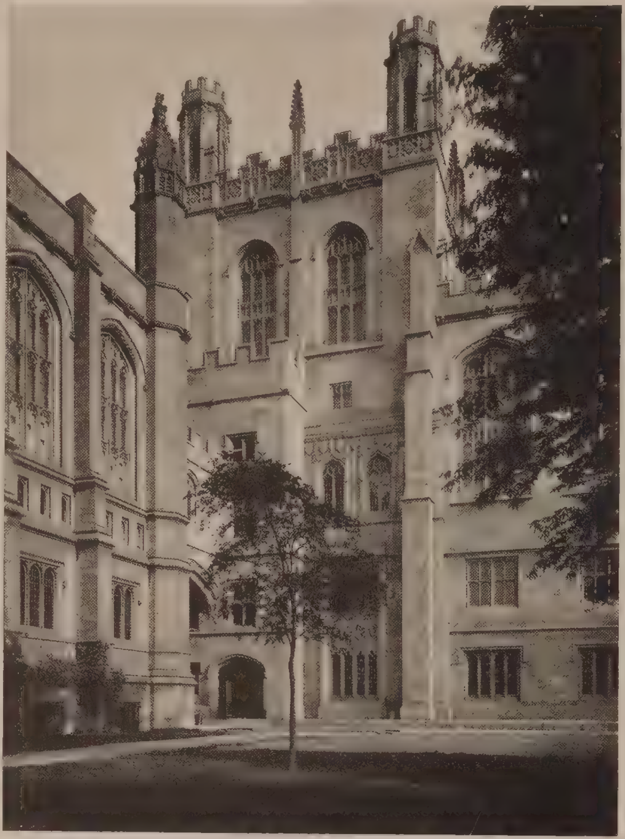
not crowded so closely together as our Fifth Avenue residences, but are separated by lawns with many trees, some of them already of considerable size, and the apartment houses with which they are interspersed are, as a rule, low and picturesque informal structures, and not the customary New York type consisting of a façade with three common brick walls at the sides and rear. This is true of much of the apartment house work in Chicago; many of them are crude and tasteless imitation of what we are accustomed to think of as the Chicago school, and which appears to be even more offensive when designed by unsympathetic hands than is our Bronx Classic, but a very large proportion have the redeeming quality of not being placed immediately on the lot line, and have in front of them some foliage which serves to hide their rawness of coloring and design. The soot of Chicago will doubtless continue to play its part in amending these architectural errors, but it is rather curious to find that in Detroit, Pittsburg and Chicago alike, many of the architects are striving to obtain interest through the medium of color, a thing manifestly impossible because of the smoky atmosphere, while form, which should be the pre-eminent object, is too often disregarded. This is not true of the work of the best man; they have appreciated this fact; but it is true of the great mass of designers who determine the aspect of the bulk of the work in Chicago as in every other city.

At the opposite end of Chicago from the Lake Shore Drive is Jackson Park, the former site of the World's Fair of 1893, connected by the Midway Plaisance to Washington Park, and around these two parks and the Midway which connects them, has grown up a residence center comparable in a way to the development between Riverside and Morningside Parks in New York. Few of the houses of the very rich have been built there, but there are many small houses of good character, and a multitude of low apartment houses of considerable interest, intended, it appears, to house the students and teachers of the University of Chicago. The University faces the Midway between the two parks, and contains two groups of buildings of extraordinarily good quality, the Library group and the Refectory Group, both designed by Shepley, Rutan and Coolidge. Two new buildings now in course of construction do not promise to equal these, not a cause for surprise, since the Refectory appears to me to be the most interesting building of its kind in America, with the possible exception of that of the Graduate School in Princeton. The University with the houses about it form a city within a city, and has a small-town collegiate air quite distinct from the rest of Chicago. The transformation wrought in this part of the city since the time of the World's Fair will be quite astonishing to those who have not seen it during the interim.


TOWER, HARPER MEMORIAL LIBRARY, CHICAGO.
Shepley, Rutan & Coolidge, Architects.

Jackson Park would never be recognized; no trace of the Court of Honor remains, broad lagoons occupy the sites of many of the big buildings, and of the great group there erected, only three remain, the Art Building, now used as the Field Columbian Museum (and a very magnificent piece of Classic architecture it is) the German building, and the little "La Rabida" beside which still lie Columbus' ships!

The most attractive portions of Chicago proper thus stretch along the lake front from Jackson Park on the south to Loyola College on the north, facing a long fringe of green, interrupted by groups of commercial buildings, erected before the parking scheme along the lake was contemplated. These jutting promontories of ugliness the city is now endeavoring to surround by a system of parkways obtained through filling in the lake in front of the buildings. Back of this lies the body of Chicago, a mass of grimy factories, and dingy brick houses, with not infrequent wooden survivors of the great fire in such complete disrepair that they seem to have been survivors of the flood.

These things are the usual concomitants of any great city, but their unattractiveness is very considerably lessened in Chicago by an intelligent system of parking and connecting boulevards which has been adhered to with determination and taste. No other city of any size in this country has succeeded in so thoroughly surrounding and intersecting itself with green boulevards and lovely parks as Chicago, and no other city which I have seen; has utilized these parks so wisely, not alone as green spots but as play grounds for the children and young men. At the noon hour and after the day's work, every park is filled with young men and boys playing games: baseball or football or soccer or tennis, over well kept lawns, apparently without any damage to them, and in the most casual manner, and throughout the day multitudes of children continuously occupy them.

Among the factories there are many of very considerable interest; the great warehouses of Butler Brothers rise along the Chicago river like steep unbroken cliffs; and as the saw tooth shop seems not to have been received with much favor by the Chicago manufacturers, many of the factories form picturesque (if unintelligible groups), which have about them something fascinating because of their tile roofs and the interesting color of raw brick overlaid with soot. Chicago makes no attempt to disguise the industrial character of much of the city, but permits it to be seen in its true character, and I find it hardly less interesting than the more spruce or stately portions.

The delight of every Chicago man is the suburbs which surround the city, and they have unquestionably in Winnetka, Wilmette, Lake Forest, Lake Geneva, Kenilworth and other towns, suburbs as completely laid out and as well designed as anything in the East. Lake Forest in particular is a very charming place; the country has begun to roll slightly, losing for a time the dead level characteristic of the immediate vicinity of Chicago; it is intersected with steep-sided shallow ravines crossed by frequent and sometimes interesting bridges. The gridiron plan is conspicuously absent, and the houses for the most part occupy spacious grounds and are well set back from the road. The average of design is very high; Howard Shaw, Schmitt, Garden and Martin, Charles A. Platt, Adler & Dangler, Arthur Heun, George T. Mahar, Brown & Walcott, Harrie T. Lindeberg, and many other men of high quality have there one or more examples of their work, and certain of the houses are wonderfully set on the lake front, and are worthy of their location. The Ontwentsia Club occupies a rather picturesque site with an extended view over the back country; extended not as much because it is on a hill, as because the country, like the center of Long Island, is one where a gentle eminence counts for a good deal, and while the club house itself is more or less a makeshift and not particularly interesting architecturally, the club as a whole is extremely attractive. In fact it may be said that Chicago is very well equipped with clubs, and their functions are rather more differentiated than is the case in New York, so that the Saddle and Cycle Club (which occupies a very amusing little building designed by Jarvis Hunt in a picturesque location on the lake border surrounded by a very lovely garden), occupies a place quite as distinct in club life as does the University Club or the Cliff Dwellers or the Chicago Club. Of the building of the University Club I have before spoken; the Chicago Club has a dignified if grandiose old house of Richardsonian architecture, which befits its character; the Cliff Dwellers, in which the literary and artistic element are supposed to meet daily for luncheon, occupies the top of Orchestra Hall with a wonderful view over the lake; the City Club is very truly a club concerned with the development of the city, and its quarters, if not luxurious, have at least an earnest and serious aspect befitting its purposes.

This differentiation of purpose which marks the clubs seems to be a reflection of the organized and efficient spirit of the city, which has marked out for itself the uses to which its various portions shall be put, and is pursuing its purpose with energy, skill, intelligence and taste. This organized efficiency seems to be characteristic of the city's artistic as well as commercial development. Within the past few weeks ten tremendous bond issues have been approved by the people for the purpose of continuing the adornment of the city, continuing, not beginning, for Chicago long ago determined that she is to be beautiful, and likewise decided how to go about it. And because the predetermined plan is being followed, there is no lost effort in the process; no haphazard spending to meet the views of small groups of politicians but orderly progress, which has already achieved great results, and which will eventually completely realize the dream of the people of that great commercial idealistic city.

VIII. ENGINEERING FOR ARCHITECTS

BY DEWITT CLINTON POND

Mr. Pond has charge of the practical course in structural design at Columbia University. He is extremely successful in instructing men who have had little knowledge of mathematics, and these articles have been written with that in view.

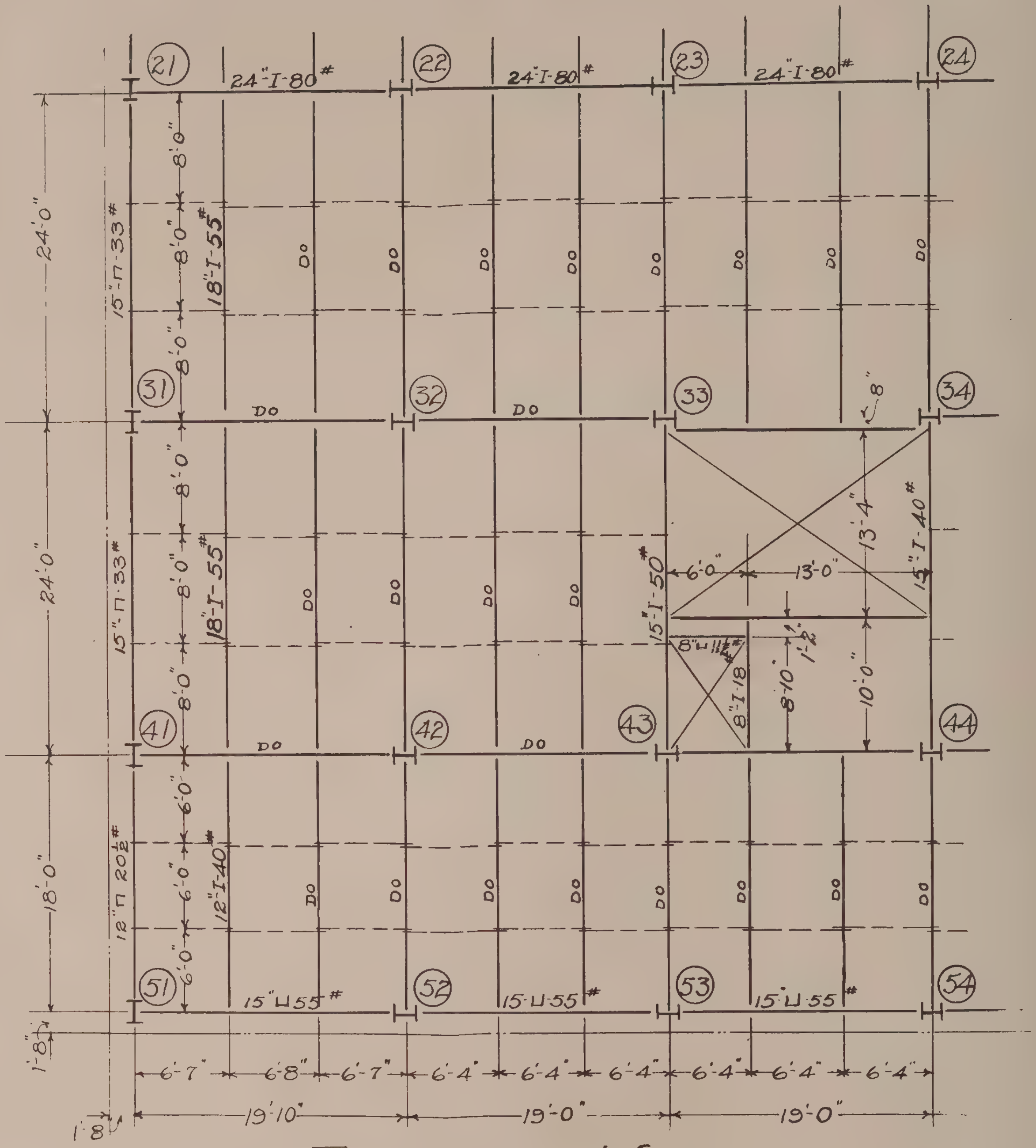
THE general principles outlined in the foregoing articles can be applied to nearly all conditions encountered in designing the steel for a building. Just how to apply such knowledge, however, is sometimes a question. There are certain methods employed by an engineer which are extremely simple in themselves, but which are necessary if records are to be kept of the calculations, and which also facilitate the work. The architect who may know exactly how to determine the maximum bending moment in a beam and who can determine the radius of gyration of a column section may be at a loss to know how to use these calculations, and a knowledge of the methods referred to above will undoubtedly be of assistance to him.

The first step to be taken in determining the steel for any building, is to lay out the framing plan for a typical floor. In order to do this it is necessary to stretch tracing paper over the architect's plan and locate the columns. The architect himself has a great deal to say about the last question. Columns must be placed so as not to interfere with the circulation and not to project into rooms. In loft buildings, department stores, warehouses and buildings used for manufacturing purposes, the location of columns depends more upon engineering rather than architectural requirements. Architects often want to space columns too far apart for engineering requirements and engineers want them too near together to suit the architect. If possible the columns should divide the plan into rectangles or "bays." These bays should have approximate dimensions of eighteen feet by twenty-four feet. Of course there are many cases in which such dimensions are impossible and the rectangles may become larger or smaller, but a span of over twenty-four feet for either beams or girders gives excessive depths and a span of less than eighteen feet often results in uneconomical sections.

Figure 46 shows a portion of a typical framing plan of a department store. The walls are self-supporting and columns are used only as braces as far as the walls are concerned. The floor load is taken as 200 pounds per square foot. In the bay included between columns 33, 34, 43 and 44 framing for elevator shafts and stair wells is shown. Aside from this framing the plan is perfectly simple.

As shown the girders are shorter than the beams. This is the usual method of framing because it gives beams and girders of comparatively the same depth. If the conditions were reversed there would be excessively deep girders and beams that would be—architecturally speaking—"out of scale."

In the original layout the columns are merely indicated



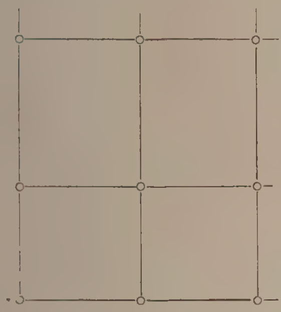
FIGVRE 46

by circles and the beams framing directly to the columns are drawn in as shown in Fig. 47. At this point it may be noted that such beams and girders as shown must be framed directly to the column centres in order to secure stiffness. Occasionally, as between columns 33 and 34, in order to meet architectural requirements it may be necessary to frame a girder a little off centre, but this should never be done in such a manner as to make a direct connection between the column and girder impossible.

Once this much is drawn, beams are indicated and a tentative plan is laid out. Then the actual work of figuring is begun.

In order to have a complete set of figures a careful record of all calculations must be kept. Some engineers use books, others have loose leaf binders, and some simply have specially made pads of paper. Whatever the method, every calculation should be recorded and no figures which have not a direct bearing on the engineering problems should be entered in the record.

To start the calculations, a bay which represents the most common conditions is chosen. Such a bay is found included between columns 21, 22, 31, 32. The engineer starts by making a small sketch of this bay on his notes (Fig. 48). Then, having determined the floor load he finds the total uniform load which a beam has to carry. Each beam is 24 feet long and carries a load that extends over an area 6.6 feet wide by 24 feet long. The total floor load on the beam is then 31,680 pounds. Looking in the hand book the safe load for an 18-inch 55-pound I-beam, spanning 24 feet is 39,290 pounds, so this beam will be selected. This completes the calculation for the filling in beams and a line is drawn. In connection with the above calculation it may be well to call attention to the fact that although a 15-inch 60-pound I-beam will carry the load, the 18-inch beam will be five pounds per foot lighter and this saving for all the beams in all the floor panels will be considerable.



FIGVRE 47

The next consideration is to determine the size of the girder between columns 31 and 32. For the purpose a sketch is made indicatng the loads and their positions. The loads are brought to the girder by the beams considered above and act as two concentrated loads. If we consider that all the weight of the floor arches is carried by the beams, there is no uniform load on the girder. As the loading is symmetrical, the reactions will be equal and each reaction will be 31,700 pounds. The maximum bending moment will be found at the point where either beam frames into the girder. To find I/c simply divide this bending moment in *inch pounds* by S—the safe working stress for steel—or 16,000 pounds per square inch. This is found to be 157 and a 24-inch, 80-pound I-beam will be selected. The sizes of these beams and girders must be noted on the plan. The girders and beams in panels 22, 23, 32 and 33 will be the same as those shown above.

In the lower panels it may be well to make a trial to see whether it would be better to frame the beams as shown or to have them parallel to the longest dimension of the bay. First consider the condition indicated on the plan.

A small sketch of the bay should be drawn. The load on the beams will be 23,800 pounds and in the handbook will be found a 12-inch 40-pound I-beam that will carry the load over a span of 20 feet. A 12″, 20½ lb. channel will be strong enough to carry the load between columns 41 to 51. Girder 41-42 will have two concentrated loads upon it. These loads will be found by adding one-half the load on each beam in panel 21-22-31-32 to one-half the load on each beam in the panel at present under consideration. One-half of 31,680 is 15,840 and one-half of 23,800 is 11,900 so each concentrated load will be 27,740. The section modulus will be 137.2 and a 24-inch 80-pound I-beam will answer. To find the size of the channel necessary between columns 51 and 52, a sketch should be drawn and the two concentrated loads of 11,900 pounds located. The section modulus is found to be 59 and although I/c for a 15-inch 55-pound channel will be slightly less than this, it will be chosen as the building department will allow a slight difference of five per cent.

The weight of steel per square foot of panel will be determined as follows: One-half of the weight per foot of the girder 41-42 or 40 pounds is assumed to come in the panel. The whole weight of the channel (51-52) or 55 pounds is in the panel. The weight of these is distributed over 18 feet, so to get the weight per square foot add 55 to 40 and divide by 18. 55+40=95. 95÷18=5.3 pounds per square foot.

Each beam weighs 40 pounds per foot and this is distributed over an area 6.6 feet wide So each square foot would have 40÷6.6=6 pounds of steel from the beams. Add 6 to 5.3 and a total weight of 11.3 pounds per square foot is given as supplied by beams and girders.

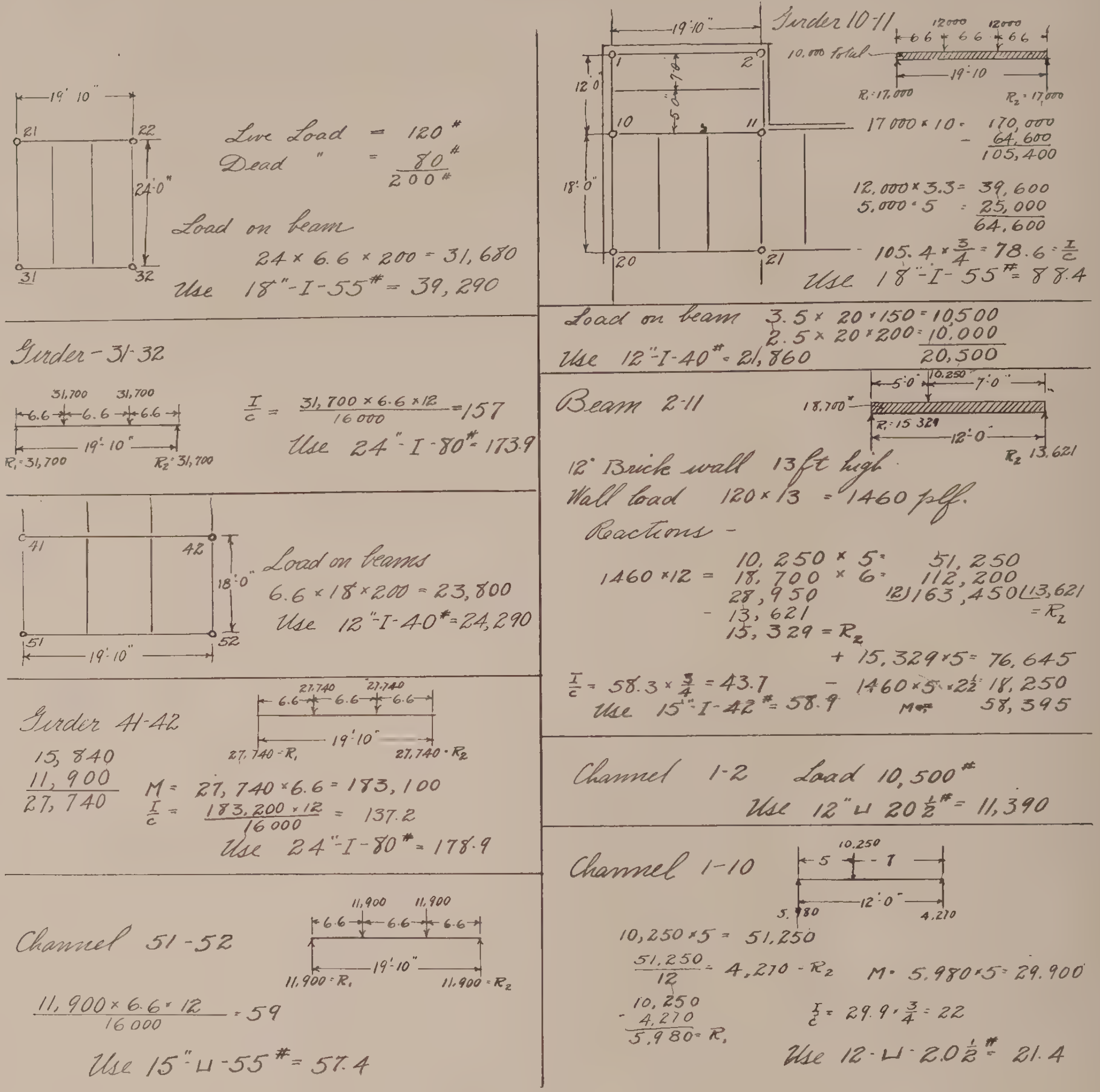
In order to test the weight of the panel with the beams framed parallel to the longest dimension, a trial sheet should be started. At the top of this the word "Trial" should be written. (Fig. 49). A sketch of the panel is made with the beams indicated as shown. The weight upon the beams is then determined as 24,000 pounds and a 15-inch, 42-pound, I-beam will be selected. Girder 42-52 will have two concentrated loads of 24,000 pounds each and the section modulus is found to be 108. A 20-inch, 65-pound I-beam will answer the requirements. For the channel between columns 41 and 51 the section modulus of 54 will be obtained—one-half of that of the girder—and a 15-inch 50-pound channel will be strong enough. A small sketch should be drawn for girder 41-42. This carries a uniform load and two concentrated loads. The total uniform load can be found—from the calculation for beams in panels 41, 42, 51 and 52—to be 12,000 pounds, and each concentrated load can be determined from the load on the beams in panel 21, 22, 31 and 32. These loads are each 15,840. The maximum bending moment will be found at the centre. The upward moment around this point will be caused by the reaction multiplied by one-half the span. The two downward moments are caused by the concentrated load (15,840 lbs.) and one-half the total uniform load.

The weight per square foot of the steel will be found as before. Forty-two pounds of steel in the beam will be distributed over 6 feet, so there will be 7 pounds of steel per square foot from the beam. 50+32=82 pounds of channel and girder distributed over 20 feet or 4.1 pounds per square foot. The total weight will be 11.1 per square foot provided we assume that the weight of girder 41-42 will about counteract the light channel 51-52.

The two weights will therefore be 11.1 in the last panel and 11.3 in the former, but there is so little difference in those two weights that it will not be noticeable. The framing shown in Fig. 46 will be adopted because a stiffer frame will result if this method is used.

In Fig. 50 a condition is shown where framing for a stair well occurs and where beam 2-11 carries a brick wall. The loading on the beams in panel 10-11-20-21 is the same as that in panel 41-42-51-52 or 23,800 pounds. Then girder 10-11 carries two concentrated loads of 12,000 pounds approximately and a uniform load caused by the floor. This load equals 10,000 pounds. The maximum bending occurs at the centre of the beam and is found to be 105,400 foot-pounds. Now in all previous calculations the usual method of determining I/c from this has been to multiply by 12 and divide by 16,000. This becomes a somewhat lengthy process and the same result will be accomplished simply by multiplying the load *in thousands of pounds* by ¾. The section modulus is then found to be 78.6, and an 18-inch 55-pound I-beam will be used. The beam used to support the stair construction will carry a uniform load from one-half the floor arch and a uniform load from one-half the stair area. The weight per square foot of stair construction is taken as 150 pounds, including both dead and live loads. The total load will be 20,500 pounds and a 12-inch, 40-pound I-beam will support it.

Beam 2-11 carries a uniform load of the wall which is 13 feet high. Engineers always figure brick as weighing

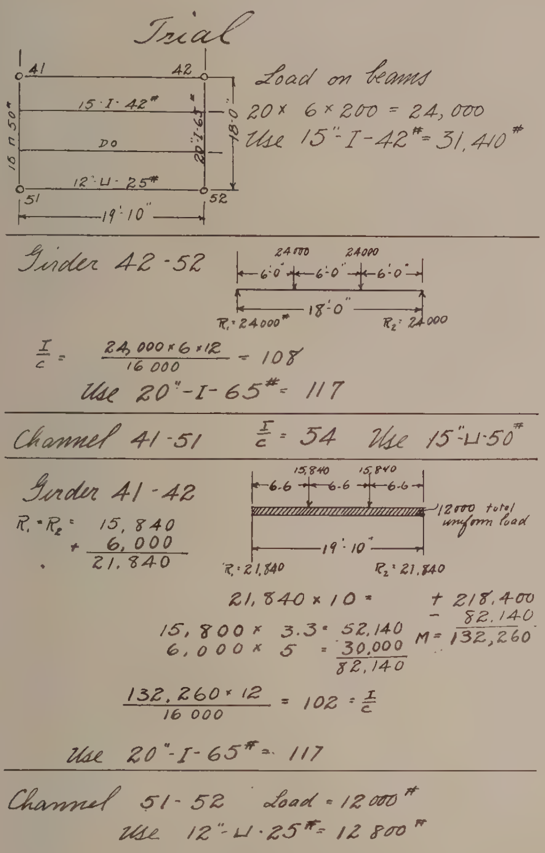


FIGVRE 48

120 pounds per cubic foot so the wall will weigh 1,460 pounds per lineal foot. The letters p.l.f. stand for the words "per lineal foot" in the calculations. The reactions are found to be 13,621 pounds and 15,329 pounds respectively. The maximum bending occurs where the uniform load is placed. The architect should check this to see if the shear changes from positive to negative at this point.

The maximum bending moment is found to be 58,395 foot-pounds and the I/c is determined as 43.7. A 15-inch, 42-pound I-beam will be selected. For the channel 1-10 a section modulus of 22 is obtained, the bending being caused simply by the load brought to the channel by the beam. A 12-inch, 20½-pound channel will be selected, although it is a little light. Channel 1-2 will carry only such a uniform load as is brought to it by the stairs and this will be carried by a 12-inch, 20½-pound channel.

The framing around the elevator shafts and stair well requires but little explanation. Girder 33-34 carries two concentrated loads brought to it by the floor beams. In some cases another concentrated load is considered. This is due to the load caused by the impact of the elevator in case the cables should break and the emergency brake cause the weight of the elevator to come upon the guides. In the present problem this load will not be taken into account as engineers figure that the live load is great enough to take care of any extraordinary conditions such as this. If the architect should adopt the methods referred to in this article he will find that the girder required will have to be an 18-inch 55-pound I-beam. The stair well considered as a simple uniform load of 150 pounds per square foot coming upon the short beam and upon beam 34-44. The short beam need be only an 8-inch 18-pound I-beam. The only loads upon the beam framing between beams 33-43 and 34-44 will be the single concentrated load brought by the 8-inch beam and the weight of a 6-inch terra cotta wall. A ten-inch 25-pound I beam will be found to be strong enough. A 15-inch 50-pound I-beam will be framed between columns 33 and 43 and a lighter, 42-pound beam between 34 and 44.

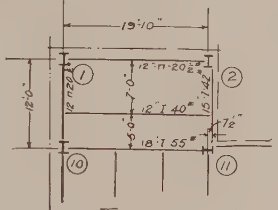


FIGVRE 49

The methods given in this article are mere suggestions of those that may be employed in actual practice. The conditions that have been considered are typical ones and although there may be many more complicated ones, the architect need have no fear of them provided he is careful in his diagnosis of the case. The chief difficulties encountered are not due to engineering considerations, but to carelessness in placing the loads or in leaving important loads out of the calculations entirely. The architect is too apt to want to start in figuring before he fully draws out the diagram that represents the methods of loading the beam.

Architects often believe that engineers have a great guessing ability and do not figure out all the conditions. This impression is absolutely wrong. Records of the best engineers in the profession show that every little detail is gone into, that there is not a single beam in a floor plan that has not been very carefully considered. Those who are most familiar with the situation realize that even with the most careful checking mistakes will occur and, because of this, as little as possible is left to chance.

An architect who found that certain considerations had been overlooked in his plans, excused his oversight to the engineers by saying that he had taken certain things for granted. The answer was made, "Be a good engineer and take nothing for granted."



FIGVRE 50

TRUE STATUS OF THE ARCHITECT

SUPERIOR workmanship in any line of industry is bound, sooner or later to receive recognition and standardize the field in which it is employed. This has become as manifest in the field of the architect as in any skilled line. That is a line of business activity requiring skill, experience and faithfulness to a mission not only constructive, but also artistic, and high grade service based on an unswerving ethical principle is expected and upon honest and honorable performance of a mission depends the good fame and fortune of the individual employed. Recently the rates established by the Institute have come under discussion. Nobody is better adapted to make a fair equitable estimate of the work of able service. The only real objectors or quibblers are those who shirk their duties, to obtain a larger profit, or the man who will cut his commission, in order to secure a task he is not competent to perform creditably.

As a rule our architects are fine grained men who are more liable to underrate their abilities than to make them pretentious. The wise layman considers the manifold ways in which a conscientious architect may save him undue expense, often amounting to a great deal more than his commission. An up-to-date architect is fully posted as to the grades and prices of material, the best market and economical uses of the same. It is in his power to discern and utilize a sense of important economies, of which the average layman is entirely ignorant. If adequately paid, the architect will use time and efficiency in striving to make a regular customer and friend. If, however, his unappreciated efforts lead to the lowering of his commission, he is not encouraged to take steps that are costly to him. A fair profit for his labor is sufficient incentive towards offering the best that is in him.

The layman owes more to the architect than he imagines. In a general way the architect is many degrees ahead of his times. Outside of a thorough knowledge of structures, past and present, he has advanced ideas of his profession, and its possibilities. When a client comes to him with a set of ideas of what he wants, it is the part of the architect to act the diplomat. If he shows the defects of the plan of his client, he is liable to antagonize this patron. In a politic way he must lead his customer into a sane and harmonious course. He must talk him out of that and talk him into this. It is difficult for him to convince the client that his years of experience count against some inharmonious extravagant plan, which, carried out, would result in an incongruity that would bring only ridicule. The architect dares not be at all dictatorial.

A further burden that lies heavy on the shoulders of the architect is the fault finding placed at his door as actual construction work begins. Under his mantle the contractor and his aids hide many a mistake. His is the responsibility in the eyes of the layman. The highest type of moral and mental equipment is required of the architect. The profession has been dignified and elevated by many men who have resisted opportunities for graft, for defective work, for haste and incompleteness. Let the practical man bear all these points in view, and realize that in this line of business activity the laborer is well deserving of his hire.

THE YOUNG ARCHITECT—WHAT WILL HE BECOME?

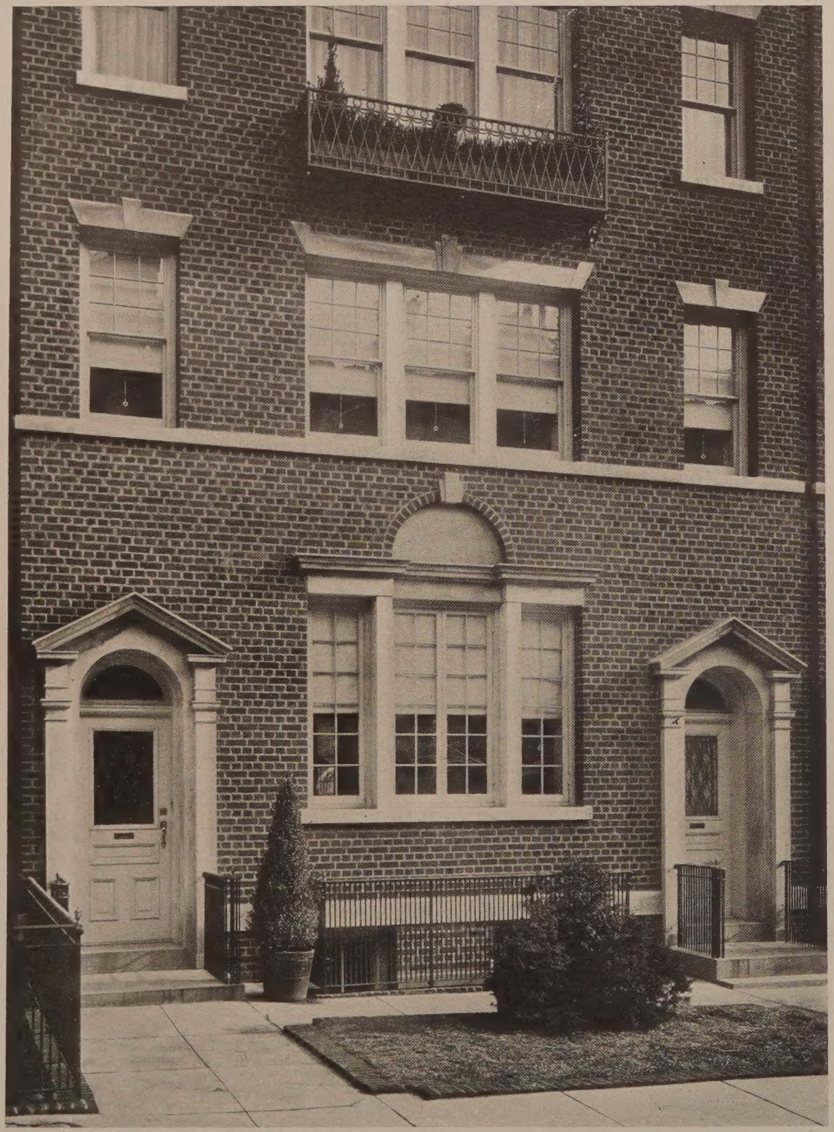
The Presidential address (Session 1814-1915) of the Architectural Association of Ireland,
by Mr. Harry Allberry, A.R.I.B,A.

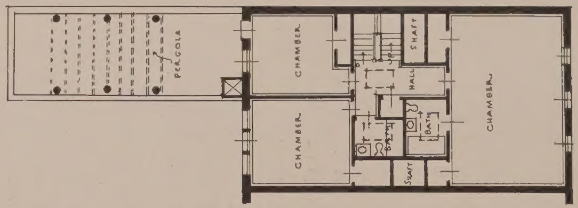
SOME of you may remember a placard which a few years ago was used—with an effect not recorded—by certain militant advocates of Temperance. It was entitled, "The Youth—What Will He Become?" I think, from recollection, that the youth was first displayed to the passer-by as a child with a somewhat disengaging type of countenance, whence in two horizontal lines we were able pictorially to trace his progress through various stages of his life, achieving on the one hand an expression of extraordinary viciousness, on the other—doubtless by restricting his powers of absorption to soda-water—attaining the proud possession of an archaic top-hat. It occurred to me, with this placard visualized, and of course, eliminating any Temperance atmosphere, that just for a few moments this evening we might consider a topic more interesting to ourselves—"The Young Architect: What will He Become?" or still more important—What will become of him? We may exclude from our thoughts him whose name is destined to be wreathed with honors and degrees, or him whose career may be popularized by certain eccentricities of genius. Men of supreme talent in the art of architecture, or the science of advertisment, are, perhaps, comparatively few in number. We will rather deal with one, let us call him, in no way offensively, "a mediocrity," to whom art will never appeal with a vary large A; but for whom drain-testing will possess a very big D, one may hope £ s. d. In the absence of independent income, and without friends of rank or influence, such a youth faces the world unarmored, and truly seeks a position of risk—and be it frankly said, of much honor—when he joins the battalions of architects, made and in the making, in these islands. Our friend may have shown some juvenile skill with the pencil, have earned some word of praise from a weary art-master in the local technical school, or, like one of the recent Presidents of the R.I.B.A., have had a taste for building rabbit-hutches and drawing tracery windows with a pair of compasses. He may have read that architects are not as other men, and been tempted by a flattering family to take up a profession which is a tripartite of art, science, and business, at once a delight and a delusion, an alluring mistress demanding life-long attention for an infrequent and generally frosty smile. Assuming any or all of these conditions, we may proceed to the day when our friend—or, rather, our friend's parents—have parted with a substantial check, and he, with shining instruments, well-sharpened pencil, and vrigin india-rubber, becomes a cadet in our ranks. There, for a space of three or four years will we leave him, passing over his days of labor and of play, for student days are vastly alike—they vanish quickly, and we heed not their going. Fortunate is he who, during these few years, has some prevision of the difficulties of the future, and a principal who fulfils his solemn engagement to train a lad to fight his way upward, for then he will, in some measure, realize that while architecture has its fascinations, it has its drudgery.

He will understand what the next decade must mean to him, and will be able to select the rightful road of the two that face most pupils when they stand alone and perplexed, their apprenticeship served, their future unassured. One of the roads appears easy, the other is a very broken road, in which he may not linger at the wayside in sport or ease, but in which he must press constantly on, with eyes and ears ever open, with hand and mind constantly engaged, not indeed, to gain wealth and notoriety, but merely to live later in some degree of comfort. In this road there are at all times too frequent intervals, tempting avenues, leading to the other and easier path, a way of undoubted fascination, for along it there is great opportunity for leisure and comparative peace of mind. But unfortunately, this road is short, and the wayfarer who has selected it finds himself in that hopeless cul-de-sac of our profession, the architectural draughtsman, whose rival is the mechanical printing machine; whose salary would not be offered to a competent artisan. We will not deal with this aspect of our profession just now, although it is one which might commend itself to the urgent attention of those who form the cabinet of architectural politics. We prefer to imagine that our mediocre friend, faced with the first serious crisis of his life, essays the ruder path, traversing alternately the mountain peaks of elation, the long dark valleys of hopelessness, to the culmination of successful architectural practice. During the years between twenty and thirty our friend must necessarily keep hard at it. In the office and out of it, in city and in village, in the work that is daily passing through his hands, and from such sought-out sources as books and classes, alone or in the companionship of other students he must unceasingly prepare himself for that end to which he aspires, making friendship by his honest dealing, reliability, and sociability—friends who, when they, in turn, attain positions in other ranks of life, will stand him in such stead. The evils of a presidential address to a student association is that it savors something of the pulpit, where one speaks and others may not hit back. But perhaps you will bear with me if I dwell over-long on a period through which many of our members are passing, or are about to pass, and from which others, to their gladness or sorrow, have but yesterday escaped. And this I say in all earnestness, to Irish students and assistants particularly, that any slackening of energy between twenty and thirty can seldom be recovered. Let us think for a moment of what is happening elsewhere, of the great architectural schools in the kingdom, turning out year by year their scores of young architects (some will, I know, call them pseudo-architects), who pass from country to country, learning more of their craft, sparing themselves nothing in their effort to qualify themselves for the future. These men are, and will remain, the competitors of the present generation of Irish students, and our friend will find them jostling him at every turn—men with a well-designed system of training, readily available, and accepted by them with eagerness and to the full.

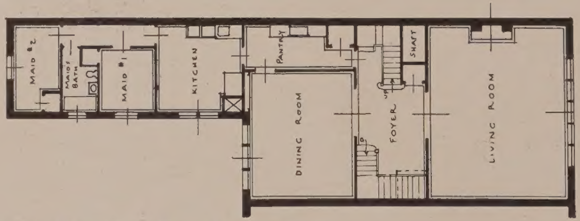
Of course, there are determining factors in success other than mere application; for instance, one's ambitions, limitations, and opportunities. Without ambition the otherwise most perfect architect will fail, and with it the man of lesser ability succeeds in some measure. For ambition, rightly directed, means tenacity of purpose, a divine discontent, which, within wide limits, makes for progress. Ambition for success, for slow and certain success, insures that each minor duty is well executed, bringing with it the after-glow of good performance and aiding that most difficult of tasks, "to keep the heights which the soul is competent to gain." Limitations may be likened to the barnacles which impede the sailing vessel; but, unlike the barnacle, they cannot be readily removed. Fortunately, one's limitations are not so much in evidence in early life, and we are often able to overcome difficulties in our youthful ignorance which would appal us or leave us gasping in later years. It is not until middle age that we fully and fearfully realize the line beyond which we may not pass, unless, perhaps, by most strenuous and exhausting endeavor. But students with high hopes have no limitations—their eyes and minds embrace the uttermost confines of architecture. Therefore should they enjoy the false horizon of youth's inverted field-glass before they take to the smoked spectacles of later-life. Lastly, and so important—opportunities. Without ambition we will not seize them when they arise; without ability we cannot master them; yet, lacking opportunity, ambition is deadened and ability expends itself in vain. Therefore, opportunities must be watched for in this country; they are but few, and those who seek them are many. The last census figures show that we have 405 members of the architectural profession and 1,229 of civil engineers in Ireland, striving to make a living. Many of the latter are, of course, doing architect's work when occasion arises. If you have read Swift's "Imitation of Horace" you will remember the ideal therein of a comfortable existence: "I've often wished that I had clear for life six hundred pounds a year, a handsome house to lodge a friend, a river at my garden's end, a terrace walk, and half a rood of land set out to plant a wood." Now, I am going to take a much lower standard than that. You will admit that £150 a year is not a very tempting income as a guerdon for many years' school and professional training; yet to achieve this for these colleagues of ours would mean, at 5 per cent. commission, an expenditure of just five millions annually on structural operations—operations, be it remembered, in which professional assistance is employed. And here we may take up the final phase of our mediocre friend's career, when, after ten or twelve years as an assistant, he leaves the comparative snugness of the harbor, walled with a weekly salary, and faces the sea of professional practice. Such a changing sea as it is—calm and shining today, surging tomorrow with combative contractors, outraged and outrageous clients, with querulous clerks of works, with assertive agents, with callers who want everything, and more who want nothing; and, worst of all, a sea traversed by shoals of idleness, when work is scarce, when there is little draughtsmanship and no drafts—shoals of such an extent that one wonders whether he will ever skirt them and reach a region of constant practice, or longs for the supposedly restful haven of a Government or municipal post. What does our friend find when he embarks on this sea? He is at once in the midst of grievous competition with his fellows, for, as I have said, the opportunities in Ireland are few. The era of church building and its concomitants for the moment is practically over. There are left dispensaries, residences, schools, laborers' cottages, and a small sprinkling of domestic and mercantile buildings. All are apparently short of money, or saying they are—nearly all requiring ninepence for fourpence, and aggrieved if they only get sixpence. Amongst his competitors he will find unskilled men far too numerous for his health, who, owning a bowing acquaintance with a 2-ft. rule, and with an awkward, and sometimes an extremely tremulous, grip of a pencil, dot the countryside with meaningless abortions. Thankful may we be to Providence that their efforts possess few elements of permanence in construction or material. He will find such men tolerated, and a profession proud of its past, and fearful of its future, clamoring for their ultimate extinction. Meanwhile, representative societies flounder around in a vicious circle, comprehending all and apparently doing little. He will learn, tyro as he is, that he must charge a minimum fee for his work—a fee which is also generally the maximum of those who, from age, experience, and ability, may be numbered amongst the front ranks of his competitors. These last and most trying conditions are unknown in other professions, as I have already on one occasion pointed out. Were the aspiring medico and the Merrion-square specialist to charge the same fees, the greenhorn in the law library and the sapient King's Counsel to require the same refreshers for their briefs, it is certain that the junior ranks of the legal and medical professions would more acutely suffer from the silent staircase, the seldom-opened door, the empty letter-box, and the appalling vacuity of a clientless office—circumstances, as we are aware, not infrequent with some young architects. It is, in my opinion, high time that those who are able should, by the exercise of some unselfishness, rise superior to the minimum fee, and, if I may say so, "Give the young 'uns a chance." Otherwise, it is of no use for us to ape the architectural Stiggins, and expect the man, who has to gain his bread-and-butter, invariably to avoid temptations which offer themselves in specious guise. It will be said, of course, that an architect should think more of his art than of his alimentary canal. I must confess myself sufficient of a Philistine to subscribe to such a theory only with many reservations. It is generally—I say generally, not wishing to be too dogmatic—propounded either by those who have never a moment's anxiety as to the sequence of their meals and the condition of their bank balance, or else by some enthusiast who can live on the smell of an oil-rag, and whose work will possibly be as evanescent. But tonight we are thinking of the mediocrity, the man who will do nothing startling, but who will put his best into what he does, an achievement which means strenuous labor on his part with help from his better-situated colleagues, not obstruction; encouragement, not exasperation.

You may rightfully ask for some high lights in a picture created with a heavy brush, and from what you may consider to be too sombre tints. It is neither unkind nor unwise, however, to remind the students of our society that the profession upon which they have embarked makes such heavy demands on their ability and patience. It is, however, not improbable, and the prospect is encouraging, that those who are now passing through their apprenticeship, or through the subsequent fateful decade, will eventually enter on a goodly heritage. I refer to the growing interest that is being taken in various social problems, the attentions that is being given to the housing of the poorer classes, the recognition of a need for better education, and for improved conditions under which children can be taught, and the knowledge that disease, once regarded as a necessary evil, can be successfully combated by hygienic surroundings. Of much importance also is the awakening interest in town planning and the "city beautiful," which, although still in the yawning stage, will develop a lusty liveliness causing surprise to those who think that cities are for them, and forget that they are for the cities. These movements, as they become more vigorous and more democratic, more practical and less garlanded with platform rhetoric, should give scope for many of our craft.

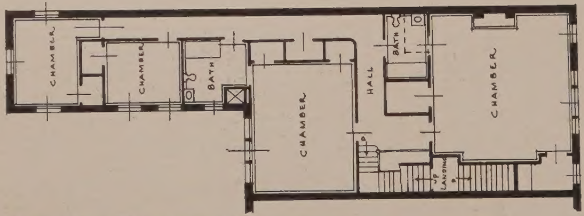




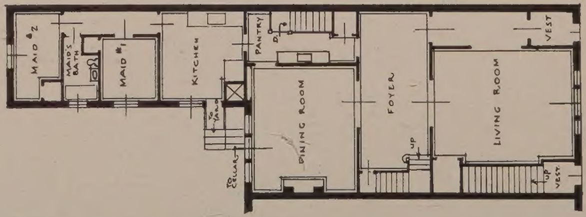
Fourth Floor Plan—Upper Apartment.



Third Floor Plan—Upper Apartment.



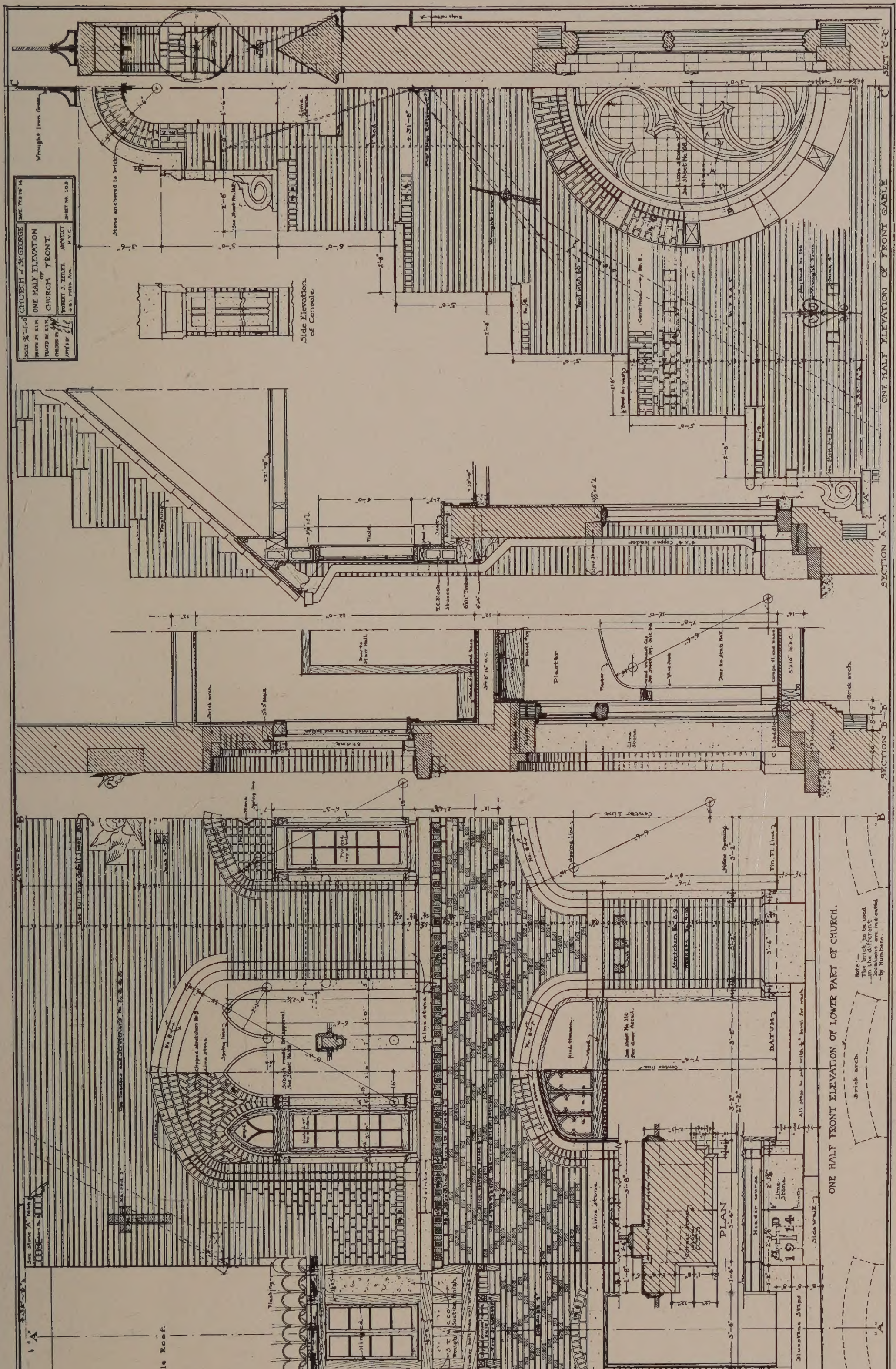
Second Floor Plan—Lower Apartment.



First Floor Plan—Lower Apartment.

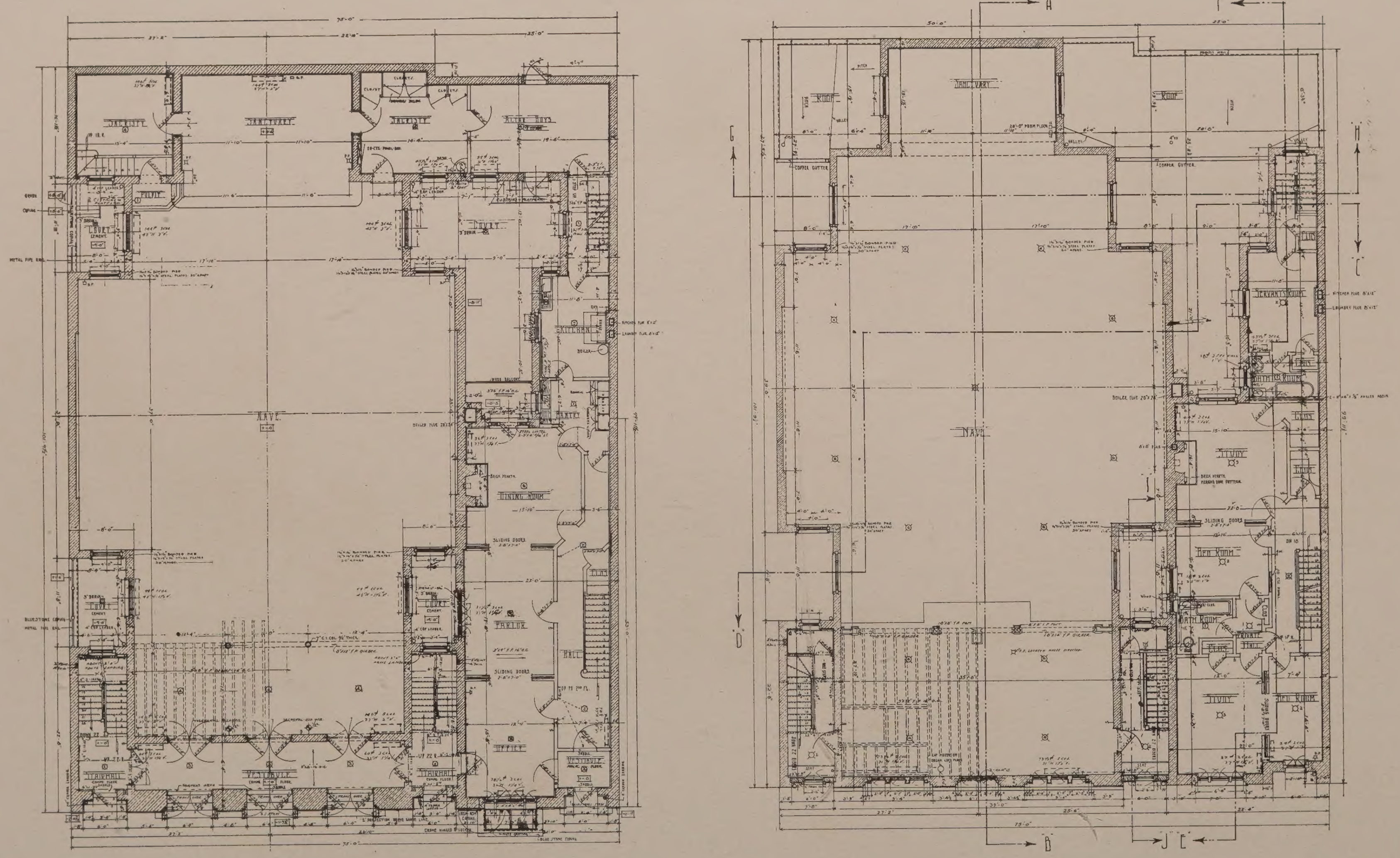
DETAIL AND PLANS, DUPLEX HOUSES, MONROE PLACE, BROOKLYN, N. Y.

Mott B. Schmidt, Architect.


CHURCH of ST GEORGE
ONE HALF ELEVATION OF CHURCH FRONT
ROBERT J. REILEY ARCHITECT
ONE HALF ELEVATION OF FRONT GABLE
SECT "C-C"
Side Elevation of Console
SECTION "A-A"
SECTION "B-B"
ONE HALF FRONT ELEVATION OF LOWER PART OF CHURCH.
PLAN
DATUM
Tile Roof
Plaster
Brick arch
Bluestone Steps
A.D. 1914

DETAIL OF ELEVATION, CHURCH OF ST. GEORGE, BROOKLYN, N. Y.

Robert J. Reiley, Architect.



PLANS, CHURCH AND RECTORY OF ST. GEORGE, BROOKLYN, N. Y.

Robert J. Reiley, Architect